**MATH 8**

**UNIT 5: Functions from Geometry**

**UNIT 6: Bivariate Numerical and Categorical Data**

**POST-STATE TESTING: Pythagorean Theorem, Polynomials, Radicals**

**YEAR-END: Activity, Reviews, Pre-Tests**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Period: \_\_\_\_\_\_\_\_**

**Unit 5: Functions From Geometry; Unit 6: Bivariate Numerical and Categorical Data; and Unit 7: Introduction to Irrational Numbers Using Geometry and**

**Post-State Testing: Operations with Polynomials**

**Engage NY: Math 8 – Module 5 – Topic B; Module 6 – Topics B and D; Module 7 – Topic A**

* Visit [www.engageny.org](http://www.engageny.org) to find additional lessons on this content.

**Engage NY: Algebra 1 – Module 1 – Topic A**

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**IXL: 8th Grade Math – Topics F, N, O, R, T, X, AA, BB, CC, DD, and EE**

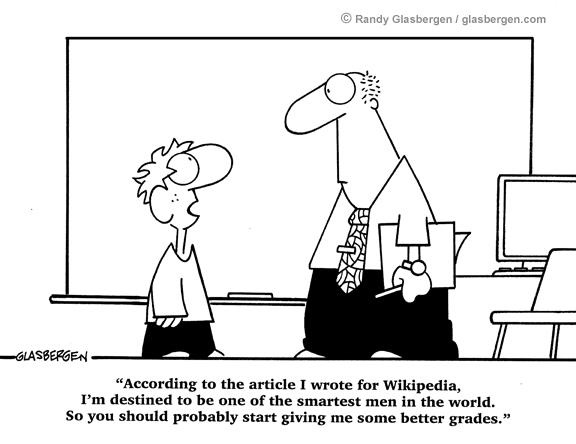
* Visit [www.ixl.com/math/grade-8](http://www.ixl.com/math/grade-8) to find additional practice problems.

**Khan Academy**

* Visit [www.khanacademy.org](http://www.khanacademy.org) for instructional videos and practice problems.  Topics can easily be found by typing the topic in the search bar (ex: “Volume of Cylinders”).

**Youtube**

* Visit [www.youtube.com](http://www.youtube.com) for additional instructional videos.  Topics can easily be found by typing the topic in the search bar (ex: “Two-Way Tables”).



**Unit 5: Functions From Geometry**

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| **Topic 1: Volume**   * **Lesson 1:** Classifying and Slicing 3D Figures (pg. 7) * **Lesson 2:** Volume of Cylinders (pg. 13) * **Lesson 3:** Volume of Cones (pg. 19) * **Lesson 4:** Volume of Spheres (pg. 25) | **Why Learn This?**  In many careers, it is essential to have the ability to recognize two-dimensional (flat) images as three-dimensional objects. |
| **Career: Surgeon**  Today, some surgeons perform specialized operations known as laser surgery. With many laser surgeries, surgeons cannot actually see the three-dimensional area where they are operating. Instead, they must rely on what they can see in two-dimensional images projected onto a screen to guide them. |

**Unit 6: Bivariate Numerical and Categorical Data**

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| **Topic 1: Bivariate Numerical Data**   * **Lesson 1:** Correlation of Scatter Plots   (pg. 35)   * **Lesson 2:** Constructing Scatter Plots   (pg. 41)   * **Lesson 3:** Line of Best Fit (pg. 47) * **Lesson 4:** Problem Solving Using Lines of Best Fit (pg. 51)   **Topic 2: Bivariate Categorical Data**   * **Lesson 1:** Two-Way Tables (pg. 59) * **Lesson 2:** Relative Frequency (pg. 65) | **Why Learn This?**  Statistics and data analysis are two mathematical areas used in multiple occupational fields. Many of those fields use information from a small sample to drive information about the larger population. |
| **Career: Quality Assurance Specialist**  How do manufacturers know that their products are well made? It is the job of the quality assurance specialist. QA specialists design tests and procedures that allow the companies to determine how good their products are. Because checking every product or procedure may not be possible, QA Specialists use sampling to predict the margin of error. |

**Post-State Testing Unit 7: Introduction to Irrational Numbers Using Geometry**

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| **Topic 1: The Pythagorean Theorem**   * **Lesson 1:** The Pythagorean Theorem   (pg. 73)   * **Lesson 2:** The Pythagorean Theorem – Length of the Hypotenuse (pg. 79) * **Lesson 3:** The Pythagorean Theorem – Length of a Leg (pg. 83)   **Topic 2: Operations with Polynomials**   * **Lesson 1:** Simplifying and Adding Polynomials (pg. 89) * **Lesson 2:** Subtracting Polynomials   (pg. 93)   * **Lesson 3:** Multiplying Polynomials – Monomials by Polynomials (pg. 97) * **Lesson 4:** Multiplying Polynomials – Binomials and Trinomials (pg. 101)   **Topic 3: Simplifying Radicals**   * **Lesson 1:** Simplifying Radicals (pg. 107) * **Lesson 2:** More Practice Simplifying Radicals pg. 111) * **Lesson 3:** Even More Practice Simplifying Radicals (pg. 115) | **Why Learn The Pythagorean Theorem?**  The Pythagorean theorem is a celebrity. Yet most of us think the formula only applies to triangles and geometry. Think again. The Pythagorean Theorem can be used with any shape and for any formula that squares a number. This 2500-year-old idea can help us understand computer science, physics, even the value of Web 2.0 social networks.  **Why Learn About Polynomials?**  The total production cost of a CD depends on the cost of the materials needed to produce it, the cost of labor, the payment made to the artist, and many other factors. These fixed and variable costs might be written into an expression that a record company could use to determine the selling price of the CD. The expressions might take the form of a polynomial.  **Why Learn About Radicals?**  Physics problems are among the many applications of radical equations. Formulas that contain the value for the acceleration due to gravity, such as free-fall times, escape velocities, and the speeds of roller coasters, can all be written as radical equations. |
| **Career: Painter**  Painters use ladders to paint on high buildings and often use the help of Pythagoras' theorem to complete their work. The painter needs to determine how tall a ladder needs to be in order to safely place the base away from the wall so it won't tip over.  **Career: Financial Analyst**  Financial analysts can be found in many business settings. They can help determine the cost of each product a company makes. Financial analysts use polynomials to calculate the relationships between production costs, selling price, total sales, and profits.  **Career: Firefighters**  Firefighters are on call and expected to respond immediately to an emergency. Other than responding to fires, firefighters are usually the first to arrive at traffic accidents or other types of medical emergencies. Firefighters in rural settings may specialize in fighting forest fires. During these fires, planes or helicopters may be used to drop water to help extinguish areas of the fire. In computing the drop, accuracy is important and using radicals instead of rounding increases the chance of success. |

**Unit 5:**

**Functions From Geometry - Volume**

**Unit 5 Topic 1 Lesson 1 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Classifying and Slicing 3D Figures**

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| **FOCUS QUESTION**: How are 3D Figures classified? | |
| **OBJECTIVES**:   * I can classify 3D figures by identifying number of faces, edges, and vertices. * I can draw a cross section. | **VOCABULARY**:  Prism Pyramid Cylinder  Cone Sphere Face  Edge Vertex Cross Section  Base |

**CLASSIFYING 3D FIGURES**

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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   * A solid with **two bases** that are congruent and parallel. * This figure is called a **triangular prism** because the bases are triangles. | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   * A solid with **one base** and sides that meet at a point. * This figure is a **triangular pyramid** because the base is a triangle. | |
| \_\_\_\_\_\_\_\_\_\_\_\_\_  A prism with circular bases. | \_\_\_\_\_\_\_\_\_\_\_\_  A pyramid with a circular base. | | \_\_\_\_\_\_\_\_\_\_\_\_\_  A solid in which each point is equidistant from a center point. |

**NAMING PRISMS & PYRAMIDS**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Directions****:* ***Classify each solid. Note the number of faces, edges, and vertices it has.*** | | | | | | | | |
| **1)** | | | **2)** | | | **3)** | | |
| **Faces:**  6 | **Edges:**  12 | **Vertices:**  8 | **Faces:**  7 | **Edges:**  12 | **Vertices:**  7 | **Faces:**  5 | **Edges:**  9 | **Vertices:**  6 |

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| **4)** | | | **5)** | | | **6)** | | |
| **Faces:**  7 | **Edges:**  15 | **Vertices:**  10 | **Faces:**  5 | **Edges:**  8 | **Vertices:**  5 | **Faces:**  4 | **Edges:**  6 | **Vertices:**  4 |
| **7)** | | | **8)** | | | **9)** | | |
| **Faces:**  6 | **Edges:**  12 | **Vertices:**  8 | **Faces:**  6 | **Edges:**  12 | **Vertices:**  8 | **Faces:**  9 | **Edges:**  16 | **Vertices:**  9 |
| **10)** | | | **11)** | | | **12)** | | |
| **Faces:**  8 | **Edges:**  18 | **Vertices:**  12 | **Faces:**  5 | **Edges:**  8 | **Vertices:**  5 | **Faces:**  5 | **Edges:**  9 | **Vertices:**  6 |

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| **SLICING 3D FIGURES**  When you slice a 3D figure, the **\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** will be a two-dimensional plane figure. For example, when a cone is sliced parallel to its base as shown to the right, the cross section that results is a circle. | | | |  |
| ***Directions:******Given each figure and a cut line, draw a diagram of the cross section from a top-side view, then name the figure.*** | | | | |
| **13)** | **Cross Section:** | **14)** | **Cross Section:** | |
| **15)** | **Cross Section:** | **16)** | **Cross Section:** | |
| **17)** | **Cross Section:** | **18)** | **Cross Section:** | |
| **19)** | **Cross Section:** | **20)** | **Cross Section:** | |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 5 Topic 1 Lesson 1 Homework: Classifying and Slicing 3D Figures**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Directions****:* ***Classify the solid. Note the number of faces, edges, and vertices it has.*** | | | | | | | | |
| **1)** | | | **2)** | | | **3)** | | |
| **Faces:**  5 | **Edges:**  9 | **Vertices:**  6 | **Faces:**  5 | **Edges:**  8 | **Vertices:**  5 | **Faces:**  6 | **Edges:**  10 | **Vertices:**  6 |
| **4)** | | | **5)** | | | **6)** | | |
| **Faces:**  10 | **Edges:**  24 | **Vertices:**  16 | **Faces:**  6 | **Edges:**  12 | **Vertices:**  8 | **Faces:**  4 | **Edges:**  6 | **Vertices:**  4 |

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| ***Directions****:* ***Draw and describe the shape that results from each cross section.*** | | | |
| **7)** | **Cross Section:** | **8)** | **Cross Section:** |
| **9)** | **Cross Section:** | **10)** | **Cross Section:** |
| **11)** | **Cross Section:** | **12)** | **Cross Section:** |

**Unit 5 Topic 1 Lesson 2 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Volume of Cylinders**

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| **FOCUS QUESTION**: How can I apply volume to cylinders? | |
| **OBJECTIVES**:   * I can use the volume formula for cylinders to find missing information. | **VOCABULARY**:  Volume Capacity Cylinder  Area of Base Height Pi (π)  Diameter Radius |

A cylindrical stack of coins is shown below. The dimensions of an individual coin are shown as well.

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|  | If you needed to find the amount of space taken up by the stack of coins, how could you use the dimensions of the individual coin to help? |

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| **VOLUME** | * The volume is the amount of 3D \_\_\_\_\_\_\_\_\_\_ occupied by an object. Volume can also be referred to as **capacity**. |
| **VOLUME OF CYLINDERS** | * To find the volume of a cylinder, multiply the area of the base by the height of cylinder. * The formula can be written as:   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   * + - * V = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_       * B = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_       * h = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * The base of the cylinder will always be a circle, so use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to find the area of the base. |

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| ***Directions****:* ***Find the volume of each cylinder. Use 3.14 for π.*** | | |
| **1)** | **2)** | **3)** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

To leave something **“in terms of pi”** means to multiply everything except for \_\_\_\_\_\_\_\_, and simply leave the

\_\_\_\_\_\_\_ symbol in your solution.

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| ***Directions****:* ***Find the volume of each cylinder, both in terms of pi and rounded to the nearest tenth.*** | | |
| **4)** | **5)** | **6)** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| ***Directions****:* ***Use what you have learned about the volume of cylinders to answer each question below. Use 3.14 for π.*** |
| **7)** The area of the base of a cylinder is 150 square inches. If the volume of the cylinder is 1050 in3, what is the height of the cylinder? |
| **8)** The volume of a cylinder is 942 cubic feet. If the height of the cylinder is 12 feet, what is the radius of the cylinder? |
| **9)** Leann has a cylindrical water tank in her backyard that has a diameter of 3 meters and a height of 2 meters. What is the capacity of the water tank? |
| **10)** Drew and Beau both have cylindrical water bottles. Drew’s water bottle has a diameter of 6 inches and a height of 7 inches. Beau’s water bottle has a diameter of 4 inches and a height of 9 inches. Whose water bottle holds more water, and how much more water does it hold? |
| **11)** Victoria bought coffee in a cup shaped like a cylinder with a radius of 3 inches and a height of 10 inches. Victoria fills the cup with coffee, but she leaves 1.5 inches of space at the top to have room for cream. What is the volume of coffee in her cup? |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 5 Topic 1 Lesson 2 Homework: Volume of Cylinders**

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| ***Directions****:* ***Use your knowledge of the volume formula to solve the questions below. Show all work, and use 3.14 for π.*** | |
| **1)** Which is the correct description of how to find the volume of a cylinder?   1. Find the circumference of the base and multiply it by the height of the cylinder. 2. Find the area of the base and multiply it be the height of the cylinder. 3. Square the area of the base and multiply it by the height of the cylinder. 4. Find the area of the base and add it to the height of the cylinder.   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **2)** Eric needs to find the area of the base of a cylinder. Which formula will help him?   1. 2πr 2. 2πrh 3. πr2 4. bh   **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **3)** Mrs. Pitts wrote the volume formula as “V = Bh.” What does the “B” represent?   1. The radius of the base. 2. The diameter of the base. 3. The circumference of the base. 4. The area of the base.   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **4)** Find the volume of the cylinder. Leave your answer in terms of π. Show all of your work.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **5)** Find the volume of the cylinder. Leave your answer in terms of π. Show all of your work.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **6)** The cylinder shown has a diameter of 11 inches. Find the volume of the cylinder. Round your solution to the nearest tenth. Show all work.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **7)** The cylinder shown has a radius of 3 inches. The height is three times the radius. Find the volume of the cylinder. Round your solution to the nearest tenth. Show all work.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **8)** A cylindrical basket has a volume of 15 cubic feet. If the height of the basket is 1.5 feet, what is the area of the base of the basket?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **9)** A container of candy is shaped like a cylinder and has a volume of 125.6 cubic centimeters. If the height of the container is 10 centimeters, what is the radius of the container?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **10)** Jacob needs to know the volume of the cylinder shown. Which expression will give him the correct volume?   1. 3.14 (482)(2.5) 2. 3.14(242)(2.5) 3. 3.14(22)(2.5) 4. 3.14(12)(2.5)   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **11)** A swimming pool is shaped like a cylinder with a radius of 15 feet and a height of 6 feet. If one cubic foot holds 7.48 gallons of water, how many gallons of water can the swimming pool hold?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Unit 5 Topic 1 Lesson 3 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Volume of Cones**

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| **FOCUS QUESTION**: How can I apply volume to cones? | |
| **OBJECTIVES**:   * I can use the volume formula for cones to find missing information. * I can relate the volume formula for cones to the volume formula for cylinders. | **VOCABULARY**:  Volume Capacity Cylinder  Area of Base Height Pi (π)  Diameter Radius Cone |

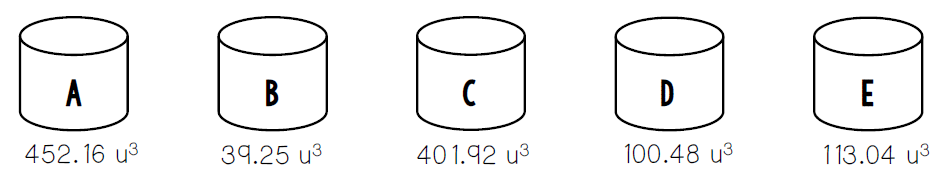
|  |  |  |
| --- | --- | --- |
| **EXAMPLE 1** |  | **EXAMPLE 2** |
| The cylinder and cone below have the same radius and the same height. |  | The cylinder and cone below have the same radius and the same height. |

Using the examples above, what do you notice about the volume of a cone compared to the volume of a cylinder with the same radius and the same height?

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| **VOLUME OF CONES** | * The volume of a cone will always be \_\_\_\_\_\_\_\_ the volume of a cylinder with the same height and radius. * The formula for the volume of a cone is:   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   * Since the base of a cone is a circle, use \_\_\_\_\_\_\_\_\_\_\_\_ to find the area of the base. |

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| ***Directions****:* ***Find the volume of each cone below. Use 3.14 for π.*** | |
| **1)**    Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **2)**    Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**3)** The volume of several cylinders is shown below. (NOTE: Cylinders are not drawn to scale.)



Use the dimensions in the table below to find the volume of each cone. Then, under the “cylinder” column, record the letter of the cylinder above that could have the same height and the same radius as the cone. Not all of the cylinders will be used.

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| **DIMENSIONS OF CONE** | **VOLUME OF CONE** | **CYLINDER** |
| Radius: 8  Height: 2 |  |  |
| Diameter: 6  Height: 4 |  |  |
| Radius: 2.5  Height: 2 |  |  |

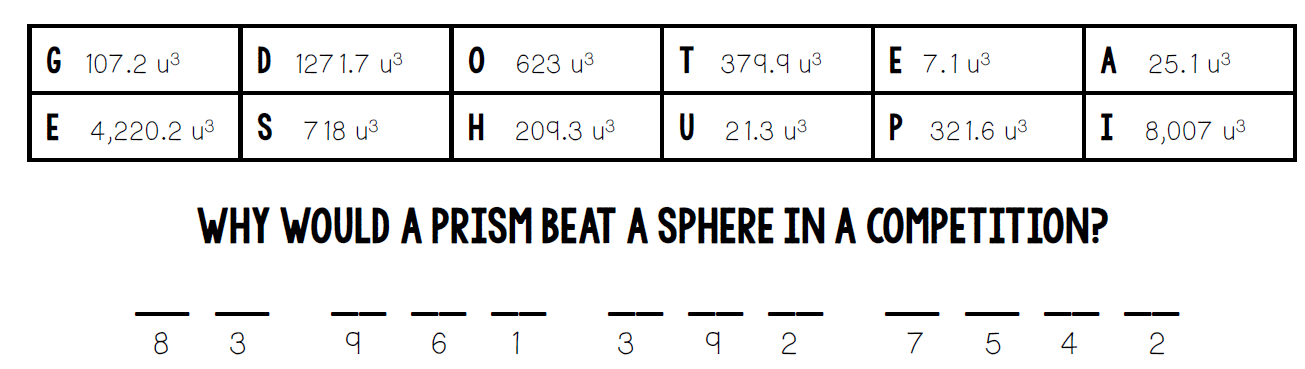
|  |
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| ***Directions****:* ***Use your knowledge of the formula for volumes of cones to answer the questions below. Use 3.14 for π.*** |
| **4)** The cone below has a diameter of 12 units and a height of 8 units. Find the volume of the cone.    \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **5)** Isabella constructed a cylindrical vase that has a volume of 63 cubic centimeters. Jason constructed a cone that has the same height and the same radius as Isabella’s cylinder. What is the volume of Jason’s cone?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **6)** A cone has a volume of 300 units3, and a cylinder has a volume of 100 units3. Is it possible that the cylinder and the cone have the same height and the same radius? Why or why not? |
| **7)** A cone has a volume of 942 cubic inches and a height of 9 inches. What is the radius of the cone?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **8)** A tea vendor gives samples of tea in cone shaped cups. The cups have a diameter of 4 inches and a height of 5 inches. If there are about 0.55 fluid ounces in one cubic inch, how many fluid ounces of tea will one sample cup hold? Round to the nearest tenth.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **9)** A cone has a volume of 7065 in3 and a height of 30 inches. What is the radius of the cone?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **10)** A cylindrical cooler has a diameter of 30 inches and a height of 24 inches. Runners in a marathon can use cone shaped cups to get a drink from the cooler. If the cups have a radius of 3 inches and a height of 4 inches, how many full cups would be able to be filled from the cooler?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **11)** Tess gets a snow cone in a cone shaped container. The container has a diameter of 3 inches and a height of 5 inches. If the snow cone costs $0.20 per cubic inch, how much would her snow cone cost if the container is filled to the top?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 5 Topic 1 Lesson 3 Homework: Volume of Cones**

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| ***Directions****:* ***Find the volume of each cone. Use 3.14 for π and round answers to the nearest tenth. Match each answer to a letter below to help you solve the riddle. Show all work.*** | | |
| **1)** | **2)** | **3)** |
| **4)** | **5)** | **6)** |
| **7)** | **8)** | **9)** |



**Unit 5 Topic 1 Lesson 4 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Volume of Spheres**

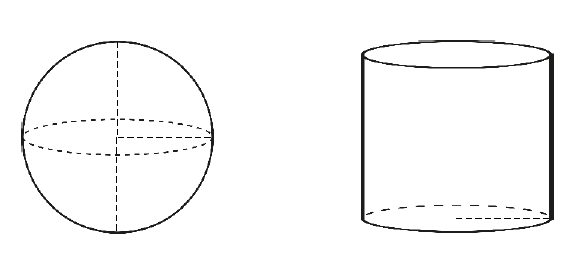
|  |  |
| --- | --- |
| **FOCUS QUESTION**: How can I apply volume to spheres? | |
| **OBJECTIVES**:   * I can use the volume formula for spheres to find missing information. | **VOCABULARY**:  Volume Capacity Pi (π)  Sphere Hemisphere Height  Diameter Radius |

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| **VOLUME OF SPHERES** | * The volume of a sphere can be found using the formula:   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   * Half of a sphere is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

If a cylinder and a sphere have the same radius and the same height (the height of the sphere would be \_\_\_\_\_\_\_),

then the sphere will have \_\_\_\_\_\_\_\_ the volume of the cylinder. Use this fact to help you see how the formula for

the volume of spheres was derived in the table below.



|  |  |
| --- | --- |
| **1)** Formula for volume of a cylinder. |  |
| **2)** Replace “h” with “2r” |  |
| **3)** Multiply the formula by |  |
| **4)** Simplify. |  |

|  |  |  |
| --- | --- | --- |
| ***Directions****:* ***Find the volume of each sphere and use 3.14 for π.*** | | |
| **1)** | **2)** | **3)** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| ***Directions****:* ***Find the volume of each sphere and leave your solutions in terms of π.*** | | |
| **4)** | **5)** | **6)** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| ***Directions****:* ***Use the formula for volume of spheres to help you answer each question. Use 3.14 for π.*** |
| **7)** A hemisphere has a radius of 7 inches. Find the volume of the hemisphere.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **8)** A stadium is shaped like a hemisphere with a radius of 150 feet. Last month, the owners of the stadium paid $0.05 per cubic foot to cover the cost of utilities. What was the total cost for utilities last month?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **9)** Jasmine is decorating her Christmas tree with ornaments shaped like spheres. There are 35 ornaments total and each has a radius of 3 inches. If the ornaments are filled with glitter, how many total cubic inches of glitter are contained in the ornaments?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **10)** Hugo has a cylindrical container that holds marbles. The container has a height of 10 inches and radius of 5 inches. Each marble is shaped like a sphere with a radius of 1 inch. If there are 150 marbles in the container, how much empty space is in the container?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 5 Topic 1 Lesson 4 Homework: Volume of Spheres**

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| ***Directions****:* ***Find the volume of each sphere. Write your answer in terms of π and rounded to the nearest tenth. Show all work.*** | |
| **1)** | **2)** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **3)** | **4)** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Plug in Values: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In Terms of π: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Nearest Tenth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| ***Directions****:* ***Answer each question below. Show all work.*** |
| **5)** Find the volume of a hemisphere that has a radius of 8 centimeters. Round to the nearest tenth.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **6)** Find the volume of a hemisphere that has a diameter of 48 inches. Leave your answer in terms of π.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **7)** A sphere has a diameter of 6 inches. Find its volume. Round to the nearest tenth.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **8)** A sphere has a diameter of 30 mm. Find its volume. Leave your answer in terms of π.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Unit 6: Bivariate and Categorical Data**

**Topic 1: Bivariate Numerical Data:**

**Scatter Plots**

**Unit 6 Topic 1 Lesson 1 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Correlation of Scatter Plots**

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| **FOCUS QUESTION**: How can you work with scatter plots? | |
| **OBJECTIVES**:   * I can identify and describe types correlation. | **VOCABULARY**:  Scatter Plot Bivariate  Strength Correlation  Outlier |

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| **SCATTER PLOTS** | A method of displaying data to analyze patterns in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ data, or data with two variables. | | | |
| **CORRELATION** | Correlation describes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between two variables. | | | |
| **TYPES OF CORRELATION** | **POSITIVE**  **CORRELATION** | Two variables have a positive correlation when the variables move together. For example, as one number increases, the other variable  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |  |
| **NEGATIVE CORRELATION** | Two variables have a negative correlation when the variables move in opposite directions. For example, as one variable increases, the other variable  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |  |
| **NO CORRELATION** | Two variables have no correlation when the change in one variable has no effect on the second variable. | |  |
| **DESCRIBING CORRELATION** | **STRENGTH** |  |  | |
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| **LINEARITY** |  |  | |
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| **OUTLIERS** | An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a data point that doesn’t fall with the rest of the data. | |
| **CORRELATION**  **EXAMPLES** | ***Directions: Describe the type of correlation, the strength of the correlation, and whether or not it is linear.*** | |
| **1)** | **2)** |
| **3)** | **4)** |
| **5)** | **6)** |
| **7)** | **8)** |

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| **REAL-WORLD EXAMPLES** | ***Directions: Use the following scatter plot to answer questions #9-10.*** | | | |
| Suzie went to the mall and surveyed shoppers to see how many items they purchased and the total amount of money they spent at the mall. She created the scatter plot below. | | | **9)** How many shoppers did Suzie survey? |
| **10)** Does the number of items purchased seem to have an effect on the amount of money a shopper spent? Explain. |
| ***Directions****:* ***Describe the type of correlation you would expect between the following variables.*** | | | |
| **1st VARIABLE** | **2nd VARIABLE** | **CORRELATION & EXPLANATION** | |
| Hours spent studying | Grade on a test | **11)** | |
| Hours spent studying | Number of states visited | **12)** | |
| Hours spent studying | Hours spent watching T.V. | **13)** | |
| A person’s height | A person’s shoe size | **14)** | |
| The number of letters in a person’s name | A person’s IQ | **15)** | |
| The number of absences a student has | A student’s GPA | **16)** | |

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|  | ***Directions: In #17 – 19, match each scatter plot with its possible description.*** | | | |
| **17)** | **18)** | **19)** | **A)** The temperature outside and the total gallons of gas sold at a gas station.  **B)** The size of a home and the cost of monthly utility bills for the home.  **C)** The altitude of a hiker and the total oxygen level in the air. |
|  |  |  |
| ***Directions: Use the following scatter plots to answer #20 – 23.*** | | | |
| **SCATTER PLOT A** | **SCATTER PLOT B** | **20)** Which scatter plot(s) could likely represent the total number of food items ordered and the total number of calories consumed? Explain. | |
|  |  |
| **SCATTER PLOT C** | **SCATTER PLOT D** | **21)** Which scatter plot has the stronger correlation: Scatter Plot A or Scatter Plot C? Explain. | |
|  |  |
| **22)** Which scatter plot shows a nonlinear correlation: Scatter Plot A or Scatter Plot D? Explain. | | **23)** Which scatter plot shows no correlation? Explain. | |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 6 Topic 1 Lesson 1 Homework: Correlation of Scatter Plots**

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| ***Directions****:* ***Describe the type of correlation (positive, negative, no correlation) that you would expect for each situation. Explain your reasoning.*** | | | |
| **1)** Hector surveyed 500 people and asked them how far they drive to work and what the last digit of their phone number is. | | **2)** Jules conducted a survey and asked 100 people how many years of education they have and what their annual income is. | |
| **3)** What type of correlation would you expect to see between the length of a movie and the number of actors in the movie? | | **4)** What type of correlation would you expect to see between the number of hours a musician spends practicing and the number of mistakes the musician makes in a performance? | |
| ***Directions****:* ***Label the type of correlation shown by the scatter plot as positive, negative, or no correlation.*** | | | |
| **5)** | **6)** | **7)** | **8)** |
| **9)** Using the scatter plots in #5 – 8, which could be used to show the relationship between a person’s age and a person’s height? Explain. | | **10)** Using the scatter plots in #5 – 8, which could be used to show the relationship between a person’s age and the number of syllables in a person’s first and last name? Explain. | |

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| ***Directions****:* ***Use the following scatter plot to answer questions #11 – 12.*** | | |
|  | **11)** Which best describes the correlation of the scatter plot?  **A)** Negative and linear  **B)** Negative and non-linear  **C)** Positive and linear  **D)** Positive and non-linear | **12)** Which would not likely be the variables represented by the scatter plot?  **A)** The number of miles driven and the gallons of gas used.  **B)** The number of students in a school and the number of unused lockers.  **C)** The number of items ordered at a restaurant and the cost of the bill.  **D)** The number of customers in a store and the length of the wait at the register. |
| **13)** Mrs. Dominick’s class did a survey about the number of chores students did and the amount of allowance that student earned. Bryan thinks the correlation is negative because they found that as the number of chores decreased, the amount of allowance also decreased. Is Bryan correct? Explain. | | |
| ***Directions****:* ***Use the following scatter plot to answer questions #14 – 15.*** | | |
|  | | **14)** Which scatter plot has a strong correlation? Explain. |
| **15)** Which scatter plot appears to be linear? Explain. |

**Unit 6 Topic 1 Lesson 2 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Constructing Scatter Plots**

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| **FOCUS QUESTION**: How do you create a scatter plot? | |
| **OBJECTIVES**:   * I can create a scatter plot. | **VOCABULARY**:  Scatter Plot Bivariate  Strength Correlation  Linearity Outlier |

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| **INTERPRETING DATA** | Use the following scatter plot to answer questions #1-3. | **1)** Describe the correlation of this scatter plot as positive, negative, or no correlation. |
| **2)** Is there an outlier in the data? Explain. |
| **3)** Has anyone paid off their debt? How can you tell? |
| Use the following scatter plot to answer questions #4-6. | **4)** Describe the correlation of this scatter plot as positive, negative, or no correlation. |
| **5)** Is there an outlier in the data? Explain. |
| **6)** What is the age and height of the tallest child? The shortest child? |

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| **CONSTRUCTING SCATTER PLOTS** | | **(1)** | Create a table of values. | |
| **(2)** | Label each axis. | |
| **(3)** | Plot the points from the table. | |
| **EXAMPLES** | ***Directions****:* ***In the following examples, use the following data to make a scatter plot.*** | | | |
| **7)** Jared’s basketball team stood at various distances from the basketball hoop and counted the number of baskets they could make in 30 seconds. The distance each person stood from the hoop and the number of baskets made is shown in the table. | | | |
| |  |  |  | | --- | --- | --- | | **Player’s Name** | **Distance from Hoop** | **Baskets Made** | | Jared | 14 ft | 4 | | Tyrell | 25 ft | 6 | | Anthony | 27 ft | 7 | | Mark | 15 ft | 11 | | CJ | 26 ft | 6 | | Kevin | 16 ft | 13 | | Wade | 15 ft | 12 | | Kyle | 26 ft | 8 | | Chris | 16 ft | 14 | | Tim | 28 ft | 5 | | | |  |
|  | **8)** Test Scores vs Homework Scores | | |  |
| **9)** Days vs Movie Tickets Sold | | |  |

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|  | ***Directions****:* ***Use the following data to make a scatter plot and answer questions #10-11.*** | |
| The population of 10 cities, and the number of elementary schools it has, is shown in the table below. | |
|  |  |
| **10)** Describe the correlation of the scatter plot as positive, negative, or no correlation. | **11)** Are there any outliers? Explain. |
| ***Directions****:* ***Use the following data to make a scatter plot and answer questions #12-13.*** | |
| On Tuesday after school, Charlie asked nine different students how much money they had in their lunch account, as well as how many homework assignments they had that evening. | |
|  | **12)** Describe the correlation of the scatter plot as positive, negative, or no correlation. |
| **13)** Are there any outliers? Explain. |

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**Unit 6 Topic 1 Lesson 2 Homework: Constructing Scatter Plots**

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| ***Directions****:* ***Use the following information to answer questions #1 – 3.*** |
| Rebecca is researching cruises in order to plan a vacation. She records the length and total cost of different cruises in the table below.  **1)** Make a prediction about the type of correlation you would expect to see between the variables. Explain.    **2)** Construct a scatter plot using the data, and describe the correlation that you see in the scatter plot. What does the correlation mean?  **3)** Are there any outliers in the data? Explain. |

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| ***Directions****:* ***Use the following information to answer questions #4 – 8.*** |
| The table below shows the number of people painting a room and the time it takes to pain the room.  **4)** Make a prediction about the type of correlation you would expect to see between the variables. Explain.    **5)** Use the data in the table to make a scatter plot. Be sure to label each axis and the intervals. Then, describe the correlation you see between variables? |
| ***Directions****:* ***Use the scatter plot to mark each statement as true or false.*** |
| **\_\_\_\_\_\_\_\_\_\_\_ 6)** As the number of people painting increases, the time it takes to paint the room increases.  **\_\_\_\_\_\_\_\_\_\_\_ 7)** As the number of people painting decreases, the time it takes to paint the room increases.  **\_\_\_\_\_\_\_\_\_\_\_ 8)** The scatter plot does not appear to have any outliers. |

**Unit 6 Topic 1 Lesson 3 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Line of Best Fit**

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| **FOCUS QUESTION**: How can you work with line of best fit? | |
| **OBJECTIVES**:   * I can draw a line of best fit. * I can write an equation for the line of best fit. | **VOCABULARY**:  Line of Best Fit |

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| **LINE OF BEST FIT** | When scatter plots demonstrate a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ relationship, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ line can be used to show the general pattern of the data. This is called a line of best fit, or trend line. | | | | | | | | | |
| **STEPS FOR DRAWING A LINE OF BEST FIT** | **(1)** | | Draw a line through two points. | | | | | | | |
| **(2)** | | Make sure the line follows the data trend. | | | | | | | |
| **(3)** | | Make sure there are approximately the same number of points above and below the line you draw. | | | | | | | |
| **EXAMPLES** | ***Directions:******Write “yes” or “no” to describe whether or not the line is a good line of best fit.*** | | | | | | | | | |
| **1)** | | | | **2)** | | | **3)** | | **4)** |
| **WRITING EQUATIONS FOR A LINE OF BEST FIT** | **(1)** | | | Pick any two points on the line of best fit and use to find the slope of the line, or m. | | | | | | |
| **(2)** | | | Look at the y-axis to find the y-intercept of the line, or b. | | | | | | |
| **(3)** | | | Use these to write the equation in slope-intercept form: y = mx + b. | | | | | | |
| **EXAMPLES** | ***Directions****:* ***Write an equation in slope-intercept form for each line of best fit.*** | | | | | | | | | |
| **5)** | | | | | **6)** | | | **7)** | |
|  | | | | |  | | |  | |
|  | | ***Directions****:* ***Use the following scatter plot and line of best fit to answer questions #8 – 9.*** | | | | | | | | |
| To find the slope of the trend line below, Miley chose the points (1, 80) and (2, 20) | | | | | **8)** Explain whether the points she chose will help her write the correct equation of the line. | | | |
| **9)** Find the equation of the trend line. | | | |
| **10)** Which of the following scatter plots could have a line of best fit with an equation of  y = 2x + 5? | | | | | | | | |
| ***Directions****:* ***Use the following scatter plot and line of best fit to answer questions #11 – 15.*** | | | | | | | | |
| Mrs. Hamilton surveyed some of her students by asking how many minutes they spent studying for their math test and the score they made on the test. The results are shown below. | | | | | **11)** What is the slope of the line of best fit? | | | |
| **12)** What does the slope mean in the context of the situation? | | | |
| **13)** What is the y-intercept of the line of best fit? | | | |
| **14)** What does the y-intercept mean in the context of the situation? | | | |
| **15)** Write the equation in slope-intercept form of the line of best fit. | | | |

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**Unit 6 Topic 1 Lesson 3 Homework: Line of Best Fit**

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| ***Directions****:* ***In #1 – 4, match each scatter plot to the equation that could represent the equation of its trend line. Not all of the choices will be used.*** | | | |
| **A)** y = 3x  **B)** y = 4x – 2  **C)** y = -x + 5  **D)** y = -5x  **E)** y = -2x – 4  **F)** y = x + 3  **G)** The relationship is not linear. | **1) \_\_\_\_\_\_\_\_\_\_** | | **2) \_\_\_\_\_\_\_\_\_\_** |
| **3) \_\_\_\_\_\_\_\_\_\_** | | **4) \_\_\_\_\_\_\_\_\_\_** |
| ***Directions****:* ***Write an equation for the line of best fit in slope-intercept form.*** | | | |
| **5)** | | **6)** | |
| **7)** | | **8)** | |

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| ***Directions****:* ***Use the scatter plot to mark each statement as true or false. If a statement is false, correct it in the space beneath each statement.*** |
| A group of hikers is descending, and the elevation of several of the hikers after a certain number of minutes is shown in the scatter plot. |
| **\_\_\_\_\_\_\_\_\_ 9)** The equation for the line of best fit is y = 2500x – 125  **\_\_\_\_\_\_\_\_\_ 10)** The group of hikers descends about 250 feet every minute.  **\_\_\_\_\_\_\_\_\_ 11)** The hikers began at an elevation of 2,500 feet.  **\_\_\_\_\_\_\_\_\_ 12)** As time increases, the elevation increases.  **\_\_\_\_\_\_\_\_\_ 13)** The graph shows a negative correlation.  **\_\_\_\_\_\_\_\_\_ 14)** There are several outliers in the scatter plot.  **\_\_\_\_\_\_\_\_\_ 15)** The scatter plot demonstrates a linear relationship. |

**Unit 6 Topic 1 Lesson 4 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Problem Solving Using Lines of Best Fit**

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| **FOCUS QUESTION**: How can you work with a line of best fit? | |
| **OBJECTIVES**:   * I can make predictions based on my line of best fit. | **VOCABULARY**:  Line of Best Fit |

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| **PROBLEM SOLVING USING LINES OF BEST FIT** | ***Directions****:* ***Use the following data to answer questions #1 – 7.*** | |
| Several members at a gym were asked how many minutes they worked out at the gym that day as well as how many calories they burned. Their answers were used to make the scatter plot below. | **1)** Write an equation for the line of best fit. |
| **2)** What does the “x” represent in the equation? |
| **3)** What does the “y” represent in the equation? |
| **4)** What is the slope of the line of best fit, and what does it represent? |
| **5)** What is the y-intercept of the line of best fit, and what does it represent? |
| **6)** Using your equation, how many calories would you expect someone to burn if they spent 120 minutes at the gym? | **7)** If someone has burned 1,740 calories, how many minutes would you predict they have spent at the gym? |

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|  | ***Directions****:* ***Use the following data to answer questions #8 – 10.*** | | | |
| At a local airport, several travelers were asked the length of their trip (in days) and then had their suitcases weighed. The collected data was used to make the scatter plot below. | | **8)** Write an equation for the line of best fit. | |
| **9)** Use your equation to predict the weight of a suitcase for someone taking a 12-day trip. | |
| **10)** Which of the following is not a true statement about the scatter plot?  **A)** The correlation of the scatter plot is positive.  **B)** The correlation of the scatter plot is linear.  **C)** For every additional day of a trip, the weight of the suitcase increases 5 pounds.  **D)** For every 5 additional days of a trip, the weight of the suitcase increases one pound. | | | |
| ***Directions****:* ***Use the following information to answer #11-13.*** | | | |
| Julian made a scatter plot to show the number of band members at his school over the years. The line of best fit of his scatter plot has an equation of y = 13x + 45, where y represents the number of band members and x represents the number of years since 1990. | | | |
| **11)** How many students would you predict to be members of the band in 1997? | **12)** How many students would you expect to be members of the band in 2010? | | **13)** In what year would you expect the band to have 370 members? |

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|  | ***Directions****:* ***Use the following information to answer #14 – 16.*** | | | |
| A scatter plot was created to show the temperature based on the altitude above sea level. The equation for the scatter plot’s line of best fit is y = -0.0035x + 59, where y represents the temperature in degrees Fahrenheit and x represents the distance above sea level in feet. | | | |
| **14)** What type of correlation would the scatter plot demonstrate? Explain. | **15)** Predict the temperature at 10,000 ft above sea level. | | **16)** Predict the distance above sea level if the temperature is 35oF. Round to the nearest tenth. |
| ***Directions****:* ***Use the following information to answer #17 – 18.*** | | | |
| A scatter plot was made to show the number of homes in a town based on the year. A line of best fit was drawn on the graph with an equation of y = 84x + 625, where x is the number of years since 1995 and y is the total number of homes in the town. | | | |
| **17)** Predict the number of homes in the town in 2015. | | **18)** Predict what year the town would have 1,213 homes. | |
| ***Directions: Use the following information to answer #19 – 20.*** | | | |
| Tim counted the number of sit-ups per minute he could do and created a scatter plot. A line of best fit was drawn on the graph with an equation of y = 10x, where x is the number of minutes and y is the number of sit-ups. | | | |
| **19)** Predict how many sit-ups Tim can do in 8 minutes. | | **20)** Predict how long it would take Tim to do 200 sit-ups. | |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 6 Topic 1 Lesson 4 Homework: Problem Solving Using Lines of Best Fit**

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| ***Directions****:* ***Use the scatter plot below to answer questions #1 – 5.*** | |
| The scatter plot below shows the cost of gas per gallon during certain years. | |
| **1)** Use the line of best fit shown on the scatter plot to answer questions A – C.  **A)** Write an equation for the line of best fit in slope-intercept form. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **B)** What does the “x” represent in the equation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **C)** What does the “y” represent in the equation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **2)** How can the equation for the line of best fit be used to predict the cost of gas per gallon in the year 1992?  **A)** Substitute 92 for x in the equation.  **B)** Substitute 92 for y in the equation.  **C)** Substitute 22 for x in the equation.  **D)** Substitute 22 for y in the equation. | **3)** Paul wants to know when gas would have cost about $1.50 per gallon. What step should he take?  **A)** Substitute 1.50 for y in the equation.  **B)** Add 1.50 to the y-intercept of the equation.  **C)** Substitute 1.50 for x in the equation.  **D)** Add 1.50 to the slope of the equation. |
| **4)** Use the line of best fit to predict the cost of gas per gallon in 2017. | **5)** Use the line of best fit to determine when gas would cost about $4 per gallon. |

|  |  |
| --- | --- |
| ***Directions****:* ***Use the following data to answer questions #6 – 10.*** | |
| The manager of a fast food restaurant collected data to study the relationship between the number of employees working registers and the amount of time customers waited in line to order. He made a scatter plot of the data and created a line of best fit with the equation y = -70x + 300, where y is the total amount of time waited in seconds and x is the number of employees working registers. | |
| **6)** Did the scatter plot of the data show positive, negative, or no correlation? Explain your reasoning. | |
| **7)** Which best describes the meaning of the slope of the equation for the line of best fit?  **A)** Customers waited an additional 70 seconds for every additional employee.  **B)** Customers waited 70 fewer seconds for every additional employee.  **C)** Customers waited an additional second for every 70 additional employees.  **D)** Customers waited 1 second fewer for every 70 additional employees. | |
| **8)** Maria went to the restaurant and waited 90 seconds to place her order. Use the equation for the line of best fit to predict how many employees were working. Round to the nearest whole number if necessary. | **9)** Kiara went to the restaurant and waited 3.5 minutes. Use the equation for the line of best fit to predict how many employees were working. Round your answer to the nearest whole number if necessary. |
| **10)** Ashton walked into the restaurant and 4 employees were working registers. Use the equation for the line of best fit to predict how long he will wait to place his order. | |

**Topic 2: Bivariate Categorical Data:**

**Two-Way Tables**

**Unit 6 Topic 2 Lesson 1 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Two-Way Tables**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: How can you work with two-way tables? | |
| **OBJECTIVES**:   * I can construct two-way tables. * I can read two-way tables. | **VOCABULARY**:  Two-Way Table |

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| --- | --- | --- |
| **TWO-WAY TABLES** | Shows data for two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ categories. | |
| **PARTS OF A TWO-WAY TABLE** | * One category is represented in rows. * The second category is represented by columns. * There are totals at the end of each row and column. * The total in the bottom right of the table represents the number of pieces of data. In this case, the number of students surveyed. | |
|  | |
| **EXAMPLES** | ***Directions****:* ***Complete each two-way table. Then use your table to answer each question.*** | |
| **1)** Lexi conducted a survey and asked participants whether they were male or female and if they preferred summer or winter. Observe the results in the two-way table below. Add each row or column to complete the “totals,” then use the table to answer each question. | |
|  | * How many males were surveyed? \_\_\_\_\_\_ * How many females were surveyed? \_\_\_\_\_\_ * How many total people were surveyed? \_\_\_\_\_\_\_ * How many people prefer summer? \_\_\_\_\_\_\_\_ * How many people prefer winter? \_\_\_\_\_\_\_\_ * How many females prefer winter? \_\_\_\_\_\_\_ * How many males prefer summer? \_\_\_\_\_\_\_ |

|  |  |
| --- | --- |
|  | **2)** Martin surveyed several students and asked if they had siblings and if they lived in a one- or two-story home. Use the survey results to complete the two-way table. Then use the table to answer each question. |
|  |
| * How many people surveyed live in a two-story home? \_\_\_\_\_\_\_ * How many people with siblings answered that they live in a two-story home? \_\_\_\_\_\_\_ * How many people surveyed did not have siblings? \_\_\_\_\_\_\_ |
| **3)** A group of middle school students was asked what grade they were in and whether they preferred video games (v), sports (s), or neither (n). Use the survey results to make a two-way table. |

|  |  |  |  |
| --- | --- | --- | --- |
|  | ***Directions****:* ***Use what you have learned about two-way tables to fill in each blank space.*** | | |
| **4)** | | **5)** |
| **6)** Use the tables from #4 – 5 to answer the following:  **a)** How many more left-handed people said they liked pancakes than waffles? \_\_\_\_\_\_\_\_  **b)** How many more brunettes said they prefer the beach to the mountains? \_\_\_\_\_\_\_\_\_\_  **c)** How many more right-handed people said they prefer waffles than left-handed? \_\_\_\_\_\_ | | |
| **CREATING TWO-WAY TABLES** | **(1)** | Label the rows with one category and the columns with the second category. | |
| **(2)** | Fill in the table with the given data. | |
| **(3)** | If data is withheld, use reasoning to complete the table. | |
| **(4)** | Make sure all total columns and rows are added correctly. | |
| **EXAMPLES** | ***Directions****:* ***Create a two-way table with the given data.*** | | |
| **7)** There are 150 children at an art camp. 71 signed up for painting. 62 children signed up for sculpting and 28 also signed up for painting. | | |
| **8)** 38 boys in 8th grade agree with the new cellphone rules, while 70 do not. 92 girls were surveyed and 41 of them agree with the new cell phone rules. | | |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 6 Topic 2 Lesson 1 Homework: Two-Way Tables**

|  |
| --- |
| ***Directions****:* ***Use the data to complete each two-way table. Then answer the questions that follow.*** |
| A survey was conducted in which participants were asked their preferred time of day between AM or PM and their choice of fast food restaurant among McDonald’s (M), Taco Bell (T), and Wendy’s (W).    **1)** Use the results from the survey to complete the two-way table.    **2)** What was the most popular restaurant choice among participants who prefer the morning?  **3)** What was the most popular restaurant choice among participants who prefer the evening?  **4)** How many more participants answered that they prefer McDonald’s than Wendy’s?  **5)** What was the least popular restaurant choice among participants who prefer the morning? |

|  |  |
| --- | --- |
| **6)** A group of people were asked if they drink coffee and if they prefer salty or sweet foods. The two-way table shows the results of the survey. Fill in each blank space of the table. | |
| **7)** The two-way table below shows the results of a survey where high school students were asked if they have a curfew. Complete the blank spaces of the two-way table. Then answer the questions that follow.    **a)** How many more freshman have a curfew than seniors? \_\_\_\_\_\_\_\_\_\_\_\_  **b)** How many more juniors were surveyed than sophomores? \_\_\_\_\_\_\_\_\_ | |
| **8)** The two-way table below shows the results of a survey where participants were asked about their gender and what their favorite season is. Fill in the blank spaces of the table, and use the results of the survey to mark each statement as true or false. | |
|  | **a)** A total of 301 people were surveyed. \_\_\_\_\_\_\_\_\_  **b)** Both male and female participants preferred winter the least. \_\_\_\_\_\_\_\_\_  **c)** 20 more participants preferred spring over summer. \_\_\_\_\_\_\_\_\_  **d)** There were an equal number of males and females surveyed. \_\_\_\_\_\_\_\_\_  **e)** The most popular season among males surveyed was summer. \_\_\_\_\_\_\_\_\_ |

**Unit 6 Topic 2 Lesson 2 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Relative Frequency**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: How can you work with two-way tables? | |
| **OBJECTIVES**:   * I can calculate relative frequency. | **VOCABULARY**:  Frequency Relative Frequency |

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| --- | --- | --- | --- | --- |
| **RELATIVE FREQUENCY** | While \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the number of times that something occurs, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  frequency tells us the number of times something occurs compared to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | | | |
| **CALCULATING RELATIVE FREQUENCY** | **(1)** | Set up a ratio comparing: . | | |
| **(2)** | Convert the ratio to a percent. | | |
| **(3)** | Read questions carefully to determine whether the “total” is referring to the entire table or a specific row or column. | | |
| **EXAMPLES** | **1)** In a survey of 50 people, 23 individuals answered that their favorite ice cream flavor was vanilla. What was the relative frequency of individuals who chose vanilla? Express your answer as a ratio and a percent.  Ratio: \_\_\_\_\_\_\_\_  Percent: \_\_\_\_\_\_\_ | | | |
| **2)** *Complete each blank space in the two-way table. Then use it to answer #3 – 6. Express each relative frequency as a ratio and a percent. Round to the nearest whole number when necessary.* | |  | |
| **3)** Of the people surveyed, what is the relative frequency of people who floss regularly?  Ratio: \_\_\_\_\_\_\_\_  Percent: \_\_\_\_\_\_\_ | | | **4)** Of the people who own a gym membership, what is the relative frequency of people who floss regularly?  Ratio: \_\_\_\_\_\_\_\_  Percent: \_\_\_\_\_\_\_ |
| **5)** Of the people who do not own a gym membership, what is the relative frequency of people who floss regularly?  Ratio: \_\_\_\_\_\_\_\_  Percent: \_\_\_\_\_\_\_ | | | **6)** Does there seem to be a relationship between people who own a gym membership and people who floss regularly? Explain. |

|  |  |  |
| --- | --- | --- |
|  | ***Directions****:* ***In each question below, express relative frequencies as percentages rounded to the nearest whole number.*** | |
| **7)** Liz wanted to see if there was any correlation between people who have kids and people who have pets. The two-way table shows her results from a survey. Complete the blank spaces. | |
| **a)** Of the people who were surveyed, what is the relative frequency of people who have pets?  **b)** Of the people who have kids, what is the relative frequency of people who have pets? |  |
| **c)** Of the people who do not have kids, what is the relative frequency of people who have pets?  **d)** Does there seem to be any relationship between people who have kids and people who have pets? Explain. | |
| **8)** Josh wanted to test the theory that red cars received more speeding tickets than any other color of vehicle. He asked drivers about the color of their vehicle and whether they had ever received a speeding ticket. Fill in the blanks of his two-way table, and answer the questions that follow. | |
|  | **a)** Of the people surveyed, what percent have received a speeding ticket?  **b)** Of the people drive red vehicles, what percent have received a speeding ticket? |
| **c)** Of the people who do not drive a red vehicle, what percent have received a speeding ticket?  **d)** What can Josh conclude from his survey?  **e)** What is the frequency of people who have received a speeding ticket?  **f)** What is the relative frequency of people who have received a speeding ticket? | |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Unit 6 Topic 2 Lesson 2 Homework: Relative Frequency**

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| ***Directions****:* ***Use the two-way table to answer each question below. Record relative frequencies as a percent rounded to the nearest whole number.*** | |
| Erika wanted to see if there was a relationship between how often someone eats fast food in a week and how the person gets to work each day. She conducted a survey where participants answered how often they eat fast food as well as whether they drive to work or use public transportation. | |
| **1)** Fill in each blank space of the two-way table. | |
| **2)** Erika wants to know the relative frequency of participants who eat fast food 3 or more times a week. Which ratio should she use to calculate her percentage?  **A)** **B)** **C)** **D)** | **3)** What is the relative frequency of participants who drive to work? |
| **4)** Of the people who drive to work, find the relative frequency of those who eat fast food the following number of times:  **a)** 0 – 2 times per week: \_\_\_\_\_\_\_\_\_  **b)** 3 or more times per week: \_\_\_\_\_\_\_\_\_ | **5)** Of the people who use public transportation, find the relative frequency of those who eat fast food the following number of times:  **a)** 0 – 2 times per week: \_\_\_\_\_\_\_\_\_  **b)** 3 or more times per week: \_\_\_\_\_\_\_\_\_ |
| **6)** Does there seem to be a relationship between how often someone eats fast food in a week and how the person gets to work each day? Explain your reasoning. | |

|  |  |  |
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| **7)** Students in a high school were asked about their favorite genre of movie. The results are organized in a two-way table below. Complete the missing spaces of the two-way table. | | |
| ***Directions****: Use the two-way table to help you match each description on the left with the correct percentage on the right. Each percent is rounded to the nearest whole number.* | | |
| **\_\_\_\_\_\_\_\_ 8)** | The relative frequency of people whose favorite movie genre is action. | **A)** 61%  **B)** 48%  **C)** 51%  **D)** 26%  **E)** 23%  **F)** 28%  **G)** 34% |
| **\_\_\_\_\_\_\_\_ 9)** | The relative frequency of female students. |
| **\_\_\_\_\_\_\_\_10)** | Of the male students, the relative frequency of those whose favorite movie genre is science fiction. |
| **\_\_\_\_\_\_\_\_11)** | The relative frequency of students whose favorite movie genre is drama. |
| **\_\_\_\_\_\_\_\_12)** | Of the students whose favorite movie genre is comedy, the relative frequency of female students. |

**Post-State Testing Unit 7: Introduction to Irrational Numbers Using Geometry**

**Topic 1: The Pythagorean Theorem**

**Post-State Testing Unit 7 Topic 1 Lesson 1 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**The Pythagorean Theorem**

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| --- | --- |
| **FOCUS QUESTION**: How is the Pythagorean Theorem used in everyday life? | |
| **OBJECTIVES**:   * I can use the Pythagorean Theorem to find the missing length of any right triangle and to solve real life problems. | **VOCABULARY**:  Pythagorean Theorem  Hypotenuse Leg |

**Theorem**: Statement or proof of something using other accepted practices.

Pythagoras was born on the Aegean island of Samos sometime between 580 B.C. and 569 B.C. He is best known for this theorem that relates the side lengths of a right triangle. Pythagoras must have had a lot of time on his hands, spending some of it working with the sides of a right triangle.

**Discovery**: Now it’s your turn to do the same. With your partner and rulers and a protractor, try to draw the following right triangles. Be exact in your measurements!

Remember, a right triangle must have a right (90°) angle.

**1)** Using at least two examples, *can* you draw a right triangle with 3 equal side lengths, that is, can you

draw a right, equilateral triangle? Circle: Yes No If your answer is no, explain why not.

**2)** Using at least two examples, *can* you draw a right triangle with 2 equal side lengths (isosceles) that are

whole numbers? Circle: Yes No If your answer is no, explain why not.

As you’re discovering, Pythagoras also realized that a right triangle cannot be an equilateral triangle. He also realized that a right triangle cannot be an isosceles triangle *whose side lengths are whole numbers*. Now what? Let’s try one more!

**3)** Draw a right triangle whose side lengths are exactly 3”, 4” and 5”. Do these side lengths truly form a

right triangle? Circle: Yes No If your answer is no, explain why not.

Pythagoras hit the jackpot with this one! He realized that in any right triangle, the sum of the squares of the lengths of the two shorter sides (legs) is equal to the square of the length of the longest side (hypotenuse). He did it with this 3-4-5 right triangle because 32 + 42 = 52 (9 + 16 = 25) and the Pythagorean Theorem was born.

The following diagram shows the beauty of this 3-4-5 right triangle and how the ‘squares’ work:

|  |  |
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| http://www.montereyinstitute.org/courses/DevelopmentalMath/COURSE_TEXT2_RESOURCE/U07_L1_T4_text_final_2_files/image004.gif | In a right-angled triangle, the square of a (a2) plus the square of b (b2) is equal to the square of c (c2):  a2 + b2 = c2 |

|  |  |
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|  | Let's check if it **does** work:  32 + 42 = 52  Calculating this becomes:  9 + 16 = 25 |

**Formula**: **a2 + b2 = c2**, where a and b are the lengths of the “**legs**” (the *two shorter sides* that form the right angle), and c is the length of the *longest side*, called the **hypotenuse**, which is always across from (opposite) the right angle.

Ways to use the Pythagorean Theorem:

**1)** Determine IF the three sides of a triangle form a RIGHT triangle.

**2)** Given a right triangle and two side lengths, find the length of the missing side.

**Ex**: **Do the following side lengths form a right triangle?**

 Use the formula to answer this question:

Does: **a2 + b2 = c2 ?**

92 + 122 = 152 (Substitute #s for a & b)

81 + 144 = 225 (Square all numbers)

225 = 225 (Add left-side numbers)

So, **YES**, these 3 lengths **DO** form a right triangle.

|  |  |  |
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| **Pythagorean**  **Theorem**  **a2 + b2 = c2**  **When three side lengths DO form a right triangle, they are called a Pythagorean triple.** | ***Directions****:* ***Determine IF (Yes or No) the side lengths given form a right triangle.*** | |
| **1)** | **2)** |
| **3)** | **4)** |
| **5)** a = 6.4, b = 12, c = 12.2 | **6)** a = 2.1, b = 7.2, c = 7.5 |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Unit 7 Topic 1 Lesson 1 Homework: The Pythagorean Theorem**

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| --- | --- |
| ***Directions: Use the Pythagorean Theorem to determine IF (Yes or No) the 3 given side lengths forma right triangle.*** | |
| **1)** **a = 5, b = 12, c = 13** | **2)** |
| **3)**  **8.94** | **4)**  **8** |
| **5)**  **11** | **6) a = 30, b = 72, c = 78** |
| **7) a = 8, b = 15, c = 17** | **8) a = 6.3, b = 6.4 c = 10.7** |
| **9)**  **6** | **10) a = 45.7, b = 53, c = 70** |

**Post-State Testing Unit 7 Topic 1 Lesson 2 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**The Pythagorean Theorem – Length of the Hypotenuse**

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| --- | --- |
| **FOCUS QUESTION**: How is the Pythagorean Theorem used in everyday life? | |
| **OBJECTIVES**:   * I can use the Pythagorean Theorem to find the missing length of any right triangle and to solve real life problems. | **VOCABULARY**:  Pythagorean Theorem  Hypotenuse Leg |

In today’s lesson, you will use the Pythagorean Theorem to find the length of a right triangle’s (missing) hypotenuse.

|  |  |
| --- | --- |
| **STEPS to FIND the HYPOTENUSE of a**  **RIGHT TRIANGLE** | **1) Write the formula: a2 + b2 = c2** |
| **2) Substitute lengths in place of a & b** |
| **3) Square the numbers** |
| **4) ADD the left-side numbers** |
| **5) Take the square root of both sides** |
| **6) If stated, round answer to indicated place** |

**Ex**: **Find length of ? to the nearest tenth.** **To find the length of a hypotenuse, c:** Use the formula to

answer this question:

 **a2 + b2 = c2**

22 + 52 = c2 (Substitute #s for a & b; finding c)

4 + 25 = c2 (Square all numbers)

?

29 = c2 (Add left-side numbers)

 (Square root both sides)

c = 5.4 (Find square root of #)

**Ex**: **Find length of c to the nearest tenth.** **To find the length of a hypotenuse, c:** Use the formula to

answer this question:

**a2 + b2 = c2**

11.2 mm c 11.22 + 16.82 = c2

125.44 + 282.24 = c2

407.68 = c2

16.8 mm 

c = 20.2

|  |  |
| --- | --- |
| ***Directions: Use the Pythagorean Theorem to find the missing hypotenuse to the nearest tenth.*** | |
| **1)** | **2)** |
| **3)** | **4)** |
| **5)** | **6)** |

**Independent Practice**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Unit 7 Topic 1 Lesson 2 Homework: The Pythagorean Theorem – Length of the Hypotenuse**

|  |  |
| --- | --- |
| ***Directions: Use the Pythagorean Theorem to find the length of the (missing) hypotenuse to the nearest tenth.*** | |
| **1)**  7 ?  21 | **2)**  12?  23 |
| **3)**    8 ?      18 | **4)**  ? |
| **5)**  ? | **6)**  ? |
| **7)**  ? | **8)**  ? |

**9)** A soccer field is a rectangle 90 meters wide and 120 meters long. The coach asks players to run from

One corner to the other corner diagonally. What is the distance?

**10)** What is the length of the diagonal of a 10 cm by a 15 cm rectangle?

**Post-State Testing Unit 7 Topic 1 Lesson 3 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**The Pythagorean Theorem – Length of a Leg**

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| --- | --- |
| **FOCUS QUESTION**: How is the Pythagorean Theorem used in everyday life? | |
| **OBJECTIVES**:   * I can use the Pythagorean Theorem to find the missing length of any right triangle and to solve real life problems. | **VOCABULARY**:  Pythagorean Theorem  Hypotenuse Leg |

In today’s lesson, you will use the Pythagorean Theorem to find the length of a right triangle’s (missing) leg (a or b in the formula).

|  |  |
| --- | --- |
| **STEPS to FIND the LEG**  **of a**  **RIGHT TRIANGLE** | **1) Write the formula: a2 + b2 = c2** |
| **2) Substitute lengths in place of a or b and c** |
| **3) Square the numbers (a or b on the left-side and c)** |
| **4) SUBTRACT the left-side number from both sides** |
| **5) Take the square root of both sides** |
| **6) If stated, round answer to indicated place** |

**Ex**: **Find length of ? to the nearest tenth.** **To find the length of a leg, a or b:** Use the formula to

answer this question:

**a2 + b2 = c2**

112 + b2 = 242 (Substitute #s for a & c; (finding b)

121 + b2 = 576 (Square all numbers)

-121 -121 (Subtract to find b2)

11 24 b2 = 455 (Do subtraction)

 (Square root both sides)

b = 21.3 (Find square root of #)

?

**Ex**: **Find length of ? to the nearest tenth.** **To find the length of a leg, a or b:** Use the formula to

answer this question:

**a2 + b2 = c2**

? 22 a2 + 202 = 222 (Finding a in this example)

a2 + 400 = 484

-400 = -400

20 a2 = 84



a = 9.2

**Independent Practice**

|  |  |
| --- | --- |
| ***Directions: Use the Pythagorean Theorem to find the missing leg, to the nearest tenth.*** | |
| **1)** | **2)** |
| **3)** | **4)** |
| **5)** | **6)** |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Unit 7 Topic 1 Lesson 3 Homework: The Pythagorean Theorem – Length of a Leg**

|  |  |
| --- | --- |
| ***Directions: Use the Pythagorean Theorem to find the length of the missing side (leg or hypotenuse), to the nearest tenth.*** | |
| **1)**  11 17  ? | **2)**  ?15  12 |
| **3)**  7 11  ? | **4)**  11 15  ? |
| **5)**    10 ?  12 | **6)**  8 ?  18 |
| **7) a = 6, b = ?, c = 11** | **8) a = 3, b = ?, c = 11** |
| **9)**    7 ?  13 | **10)**  8 ?  9 |
| **11) a = 5, b = ?, c = 12** | **12) a = 8, b = ?, c = 20** |

**Topic 2: Operations with Polynomials**

**Post-State Testing Topic 2 Lesson 1 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Simplifying and Adding Polynomials**

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| **FOCUS QUESTION**: How are polynomials use in real life? | |
| **OBJECTIVES**:   * I can classify polynomials by the number of terms. I can simplify a polynomial. I can add polynomials and write the answer in standard form. | **VOCABULARY**:  Monomial Binomial  Trinomial Polynomial  Standard Form Degree |

**Monomial:** One, single term.

The **degree** of a monomial is the sum of all exponents.

**Binomial:** The sum or difference of two (unlike) monomials.

**Trinomial**: The sum and/or difference of three (unlike) monomials.

**Polynomial**: (poly = many): Any monomial or the sum or difference of monomials. Polynomials with more than 3 terms do not have special names.

The **degree** of a polynomial is the highest degree of any of its monomial terms.

**Simplify**: Combine LIKE terms.

**Standard Form (of a polynomial)**: To write a simplified answer in descending/decreasing order, starting with the ***highest exponent-term***, down to the ***lowest exponent-term***.

**To ADD polynomials**: Combine LIKE terms and write answer in standard form.

|  |  |
| --- | --- |
| **EXAMPLES** | (8x2 – 2x + 3) + (9x – 5) = **8x2 + 7x – 2** |
| (–3cd2 – 2cd + 5) + (9cd – 7cd2 – 5) = –**10cd2 – 9cd** |
| –3(x2 – 2x – 2) + 2(x + 1) = –3x2 + 6x + 6 + 2x + 2 (Distribute FIRST: the -3 and  then the 2)  = –**3x2 + 8x + 8** |

**Independent Practice:**

|  |
| --- |
| ***Directions*: Add and simplify the following polynomials.** |
| **1)** (5y3 + y2 + 2) + (4y3 + 6y2) = |
| **2)** (6a3 + 8c2 + 5ac) + (4ac – 2c2) = |
| **3)** (3m2n – 5m) + (4m + 7) + 6m2n = |
| **4)** (6x2 – 5x + 10) + (4x2 + 3x – 20) = |
| **5)** (7z3 + 15z) + (3z3 + 4z2 + 20z + 4) = |
| **6)** 12y6 + (14y6 – 10y2 + 5y) = |
| **7)** (–14a2 + 15a – 13) + (5a2 – 14a + 12) = |
| **8)** (6c3 – 4c2 + 7c) + (4c3 – 6c2) = |
| **9)** 2e(3e2 – e + 4) + 3e(4e – 3) = |
| **10)** –5r(7r2 – 5r + 4) + 5r2(5r2 + 6r) = |

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**Post-State Testing Topic 2 Lesson 1 Homework: Simplifying and Adding Polynomials**

|  |  |
| --- | --- |
| ***Directions: Add and simplify. Write answers in standard form.*** | |
| **1.** (14*a* + 5) + (10*a* + 5) | **2.** (10*c* + 12) + (6*c* – 20) |
| **3.** (+ 12*x* + 12) + (+ 10*x* + 13) | **4.** (+ 20*x* + 11) + (– 11*x* + 17) |
| **5.** ( 13*y*  10) + ( 19*y*  5) | **6.** ( 6*x* + 7) + ( 15*x*  18) |
| **7.** ( 5*x* + 9) + ( 19*x*  16) + ( 14*x*  13) | |
| **8.** ( 5*x*  14) + ( 20*x* + 8) | **9.** (+ 18*x*) + ( 9*x*) |
| **10.** (+ 13*x*  4) + ( 13*x*  10) |  |

**Post-State Testing Topic 2 Lesson 2 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Subtracting Polynomials**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: How are polynomials used in real life? | |
| **OBJECTIVES**:   * I can subtract polynomials and write the answer in standard form. | **VOCABULARY**:  Polynomial  Standard Form Distribute |

|  |  |
| --- | --- |
| **Steps To Subtract Polynomials** | **1) Leave the first polynomial the same** |
| **2) Distribute the negative across the second polynomial,**  **changing the sign of all terms inside ( )** |
| **3) Combine LIKE terms** |
| **4) Write answer in standard form** |

|  |  |
| --- | --- |
| **EXAMPLES** | **1)** (6x2 – 5x + 10) – (4x2 + 3x – 20) = 6x2 – 5x + 10 – 4x2 – 3x + 20  = **2x2 – 8x + 30** |
| **2)** (7z3 + 15z) – (3z3 + 4z2 + 20z + 4) = 7z3 + 15z – 3z3 – 4z2 – 20z – 4  = **4z3** – **4z2** – **5z – 4** |
| **3)** 12y6 – (14y6 – 10y2 + 5y) = 12y6 – 14y6 + 10y2 – 5y = –**2y5 + 10y2 – 5y** |

**Independent Practice:**

|  |
| --- |
| ***Directions*: Subtract and simplify the following polynomials.** |
| **1)** (6a3 – 4a + 10) – (4a3 + 5a2 – 3a – 5) = |
| **2)** (7c5 + 8c2) – (3c3 – 2c2 + 4c – 2) = |
| **3)** (9e4 + 6e3 – 4e + 9) – (6e3 + 5e – 3) = |
| **4)** 17m – (5m2 – 4m + 17) = |
| **5)** (6n4 – 7n3 + n2 – 7n) – (3n4 – 7n3 – 5n2 + 10) = |
| **6)** (5r2 – 6r – 7) – (6r2 + 5r + 7) = |

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**Post-State Testing Topic 2 Lesson 2 Homework: Subtracting Polynomials**

|  |  |
| --- | --- |
| ***Directions: In #1-16 subtract and write answers in standard form.*** | |
| **1)** 7a – (6a + 9) | **2)** (2b3 + 5b2 – 8) – (4b3 + b – 12) |
| **3)** (c3 + 3c + 1) – (5c3 + 2c + 4) | **4)** (2d2 – 4d + 4) – (2d2 + 4d – 4) |
| **5)** (3e3 – 5e + 3) – (2e3 + 4e2 – 6d) | **6)** (4fg + 5f – 6g) – (7fg + 6f – 4g) |
| **7)** 2(2h – 3j) – (5h + 7j) | **8)** (2k2 – 6k + 5) – (k2 – 4k + 4) |
| **9)** (2m2 – 5m + 4) – (–3m2 – 6m – 16) | **10)** (–3n3 + 4n2 – 7) – (n3 + 5n + 12) |
| **11)** (4p2 + 2p – 1) – (2p2 + 5p – 6) | **12)** 18q – (4q2 + 7q – 17) |
| **13)** (4r2 – 3r – 6) – (3r2 – 5r) | **14)** (2s2 – 5s) – (–4s3 + s2 – 5s – 1) |
| **15)** (4t3 – 3t – t2) – (6t2 + 7t – 2) | **16)** (–3u2 + v2) – (4uv – 3u2 + 2v2) |

**Post-State Testing Topic 2 Lesson 3 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Multiplying Polynomials – Monomial by Polynomials**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: How are polynomials used in real life? | |
| **OBJECTIVES**:   * I can multiply monomials by monomials. I can multiply monomials by polynomials and write the answer in standard form. | **VOCABULARY**:  Monomial Binomial Polynomial  Standard Form Distribute |

**To multiply a monomial ∙ monomial: Multiply the coefficients; keep the same base(s); ADD the exponents with the same base.**

**To multiply a monomial ∙ polynomial: Multiply the monomial outside by ALL terms inside ( ), using the process above.**

|  |  |
| --- | --- |
| **EXAMPLES** | **1)** (3x5)(4x3) = **12x8** |
| **2)** (–6y2)(7y4) = –**42y6** |
| **3)** (7a5b)(8c4) = **56a5bc4** |
|  | **4)** 4a3(6a3 – 4a2 + 5a – 7) = **24a6 – 16a5 + 20a4 – 28a3** |
| **5)** –5e2(4e5 – 3e2 + 15) = –**20e7 + 15e4 – 75e2** |

**Independent Practice:**

|  |
| --- |
| ***Directions*: Multiply the following polynomials.** |
| **1)** 3x(5x2 – 4xy + 3x – 2y + 1) = |
| **2)** –2ab(3a2b – 2ab2 – ab + 5) = |
| **3)** 6y3(7y3 – 5x2y – 6y + 12) = |
| **4)** c(3c2 – 5c + 6) = |
| **5)** –5e(e3 – 4e2 + 5e – f) |

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**Post-State Testing Topic 2 Lesson 3 Homework: Multiplying Polynomials – Monomials by Polynomials**

|  |  |
| --- | --- |
| ***Directions: Multiply coefficients; add exponents with the same base.*** | |
| **1)** –2a4(3a2) | **2)** (3b2)(–15b) |
| **3)** (6c3)(11c2) | **4)** (7de)(–8d2e) |
| **5)** –3f3g2(5f2g3) | **6)** (–2h2j)(3hj2) |
| **7)** 2km(2k – 3m) | **8)** 3m2n(2m2 + m – 6n) |
| **9)** 2p2q(–3p2 – 4p – 6q) | **10)** –r3(–r3 + 3r + 12) |
| **11)** 5s2(2s2 + 4s – 8) | **12)** 10t3(4t2 + t – 7) |
| **13)** 4u2v3(3uv – 5v) | **14)** (–2w2x)( –4wx3 + 7w2x) |
| **15)** –4yz(7y2z + 8yz2 – 6yz + 12) | **16)** –2a2b2(–4a2 + 5ab + 3b2) |
| **17)** –3abc(abc – 2ab + 3a – 4b) | **18)** 4d2e(4d2e – 4de – 4d – 4e) |
| **19)** 2u2(3u4 – 4u3 + u – 2y) | **20)** x2y2(xy – 2x + y – 4) |

**Post-State Testing Topic 2 Lesson 4 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Multiplying Polynomials – Binomials and Trinomials**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: How are polynomials used in real life? | |
| **OBJECTIVES**:   * I can multiply binomials by binomials. I can multiply binomials by polynomials and write the answer in standard form. | **VOCABULARY**:  Monomial Binomial  Trinomial Polynomial  Standard Form Distribute |

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a polynomial with two terms separated by addition or subtraction.

A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a polynomial with three terms separated by addition and/or subtraction.

To multiply binomials and/or trinomials, there are 3 different methods you can use:

**Binomial x Binomial** :

**1)** **FOIL**, otherwise known as to double distribute: **F** – first terms, **O** – outside terms, **I** – inside terms,

and **L** – last terms.

This is a special case of polynomial multiplication when you have two binomials (TWO terms multiplied by TWO terms). Follow the mnemonic **FOIL** to ensure you complete all of the necessary distribution or multiplication. **NOTE:** You should be multiplying four times! When done with multiplying, combine any LIKE terms and write answer in standard form.

**Ex:** **(3c + 5)(5c – 7) = 15c2 – 21c + 25c – 35**

**= 15c2 + 4c – 35**

**2)** **Multiply vertically:** You can multiply vertically in any situation involving binomials and/or

trinomials. This is set up very much like a normal multiplication problem: line up expressions and,

as you multiply, keep LIKE terms lined up underneath each other.

**Ex: 3c + 5**

**5c – 7**

**– 21c – 35**

**15c2 + 25c\_\_\_\_\_**

**15c2 + 4c – 35**

**3)** **Area method**: This method uses a box, placing one expression (polynomial) down the left-side and

the other expression along the top. Draw lines inside the box going across from each term and down

from each term, creating a matrix or spreadsheet of columns and rows. Multiply a term from the left-

side by a term at the top, placing its product inside that corresponding cell; repeat this process until all

cells are complete. Combine any LIKE terms (these are usually along the diagonal) and write your

simplified answer in standard form.

|  |  |  |
| --- | --- | --- |
|  | **5c** | **-7** |
| **3c** | **15c2** | **-21c** |
| **5** | **25c** | **-35** |

**Ex:** **(3c + 5)(5c – 7)**

= 15c2 – 21c + 25c – 35 = 15c2 + 4c – 35

**Independent Practice:** **Multiply the following using your preferred method:**

**1)** (x + 3)(x + 2) **2)** (x3 – 5)(x3 + 7)

**3)** (2y2 + 3)(6y – 7) **4)** (4y + 5)(2y2 – 3y – 1)

**5)** (3x – 4)2

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Topic 2 Lesson 4 Homework: Multiplying Polynomials – Binomials and Trinomials**

|  |  |
| --- | --- |
| ***Directions: Multiply using your preferred method (FOIL for binomials ONLY, vertically, area (box).*** | |
| **1.** (*x* + 2) (*x* + 6) | **2.** (*x* + 9) (*x* + 3) |
| **3.** (2*x* + 5) (*x*  4) | **4.** (*x*  7) (4*x* + 5) |
| **5.** (6*x* + 5) (2*x* + 7) | **6.** (3*x*  1) (2*x* + 6) |
| **7.** (*x*  3) (*x*  2) | **8.** (+ 7) (*x* + 4) |
| **9.** (x4 + 11)(2*x* + 5) | **10.** ( + 5) ( 6) |
| **11.** (*x*2 + 2*x* – 1)(*x* + 5) | **12.**  (2*y*2 + 2*y* – 9)(*y* – 3) |
| **13.** (3*a*2 + 4*a* – 2)(2*a* + 7) | **14.** (*c*2 – 2*c* – 5)(*c* – 4) |
| **15.** (*x*2 + 3*x* – 2)(*x*2 + 2*x* – 5) | **16.** (2*y*2 + 4*y* – 1)(*y*2 – 3*y* – 6) |

**Topic 3: Simplifying Radicals**

**Post-State Testing Unit 7 Topic 3 Lesson 1 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Simplifying Radicals**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: Why do we simplify a square root? | |
| **OBJECTIVES**:   * I can simplify a square root. | **VOCABULARY**:  Square Root Perfect Square  Radical Radicand |

When you get to 9th grade Algebra, you’ll be asked to solve a quadratic equation and to write the answer in simplest radical form.

You know that a square root is two equal factors of a number or the opposite of a number squared, and that all numbers really have two square roots: the positive and negative number.

A ***perfect square*** is a number whose square root is an integer. The first twelve perfect squares are: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, and 144; , , , , , and so on. These perfect squares continue as 132, 142, 152, 162,… When you **simplify a radical**, **one** of the **factors** **MUST BE ONE of THESE perfect square numbers,** so we can find its square root!

The square root symbol  is called a ***radical*** and the number inside/under the radical is called the ***radicand***.

**Simplest Form (of a radical)**: Contains ***no*** perfect square factors except 1.

|  |  |
| --- | --- |
| **STEPS to**  **Simplify a Radical:** | **1) Find two factors of the radicand, one of which must be**  **a perfect square > 1** (make sure it’s the ***highest*** perfect-square factor)**, and**  **write these as the product of square root factors** |
| **2) Find the square root of the perfect square number** |
| **3) Leave the square root of the non-perfect square as a radical** |

|  |  |
| --- | --- |
| **EXAMPLES** | We want to factor 12 (find 2 #s whose product equals 12 (4 and 3)  so that *one* of the numbers *is* a perfect square > 1; 4 is the  ***highest*** and its square root = 2  = **2** |
| (9 is the ***highest*** perfect square factor; its square root = 3) |
| (25 is the ***highest*** perfect square factor; its square root = 5) |

Independent Practice:

|  |  |
| --- | --- |
| ***Directions: Write the following in simplest radical form.*** | |
| 1) |  |
| 2) |  |
| 3) |  |
| **4)** |  |
| **5)** |  |
| **6)** |  |
| **7)** |  |
| **8)** |  |
| **9)** |  |
| **10)** |  |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Unit 7 Topic 3 Lesson 1 Homework: Simplifying Radicals**

|  |  |
| --- | --- |
| ***Directions: Write each of the following in simplest radical form.*** | |
| **1)** | **2)** |
| **3)** | **4)** |
| **5)** | **6)** |
| **7)** | **8)** |
| **9)** | **10)** |
| **11)** | **12)** |
| **13)** | **14)** |
| **15)** | **16)** |
| **17)** | **18)** |
| **19)** | **20)** |

**Post-State Testing Unit 7 Topic 3 Lesson 2 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**More Practice Simplifying Radicals**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: Why do we simplify a square root? | |
| **OBJECTIVES**:   * I can simplify a square root, leaving it in simplest radical form. | **VOCABULARY**:  Square Root Perfect Square  Radical Radicand |

**Reminder:** The first twelve perfect squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144…

As the value of the radicand gets larger, the process to simplify radicals doesn’t change. However, with a larger radicand, you may need more perfect squares beyond the first twelve you’ve been given. As stated in Lesson 1, to get the 13th perfect square, it’s 132, which = 169, then 142, which = 196, and so on.

**Ex. 1**: Rewrite in simplest radical form: . To simplify this, we need to divide 720 by the highest perfect square, 720 ÷ 36 = 20, but is 36 the highest perfect square that will go into 720? I can tell the answer is NO because in my answer of 6, 20 is still divisible by the perfect square of 4, so 36 is NOT the highest perfect square factor of 720! 36 times 4 equals 144, which means 720 is divisible by 144.

So  = ∙ , so the final answer is 12.

**Ex. 2:** Rewrite into simplest radical form:. 768 is divisible by 4 and it’s divisible by 64, but there’s probably another perfect square even higher than 144 that will go into 768. So, 132 = 169, 142 = 196,

152 = 225, 162 = 256, 172 = 289, so we’re going to try to divide 768 by these higher perfect squares and we’re going to start with the highest one: 768 is not divisible by 289, but 768 ÷ 256 = 3, so 256 and 3 are my two factors of 768, which leads to:  = ∙  = 16 as the final answer.

Independent Practice:

|  |  |
| --- | --- |
| ***Directions: Write the following in simplest radical form.*** | |
| 1) |  |
| 2) |  |
| 3) |  |
| **4)** |  |
| **5)** |  |
| **6)** |  |
| **7)** |  |
| **8)** |  |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Unit 7 Topic 3 Lesson 2 Homework: More Practice Simplifying Radicals**

|  |  |
| --- | --- |
| ***Directions: Write each of the following in simplest radical form.*** | |
| **1) √**86 | **2) √**27 |
| **3)** √169 | **4)** √196 |
| **5)** √48 | **6)** √56 |
| **7)** √147 | **8)** √128 |
| **9)** √99 | **10)** √84 |
| **11)** √180 | **12)** √192 |
| **13)** √200 | **14)** √135 |
| **15)** √120 | **16)** √405 |
| **17)** √250 | **18) √**392 |
| **19)** √867 | **20)** √507 |

**Post-State Testing Unit 7 Topic 3 Lesson 3 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8th Grade Math**

**Even More Practice Simplifying Radicals**

|  |  |
| --- | --- |
| **FOCUS QUESTION**: Why do we simplify a square root? | |
| **OBJECTIVES**:   * I can simplify a square root, leaving it in simplest radical form. I can simplify a radical that has a leading coefficient. | **VOCABULARY**:  Square Root Perfect Square  Radical Radicand |

If a radical has a number in front, it’s called a coefficient (just like 2*x*) and means that number is being multiplied by the radical. If you have , we say: “2 square roots of 5” or “2 times the square root of 5”.

Find the highest perfect square that the radicand is divisible by. That number and its factor are the two square root factors of that radicand. Take the square root of the perfect square and leave the other number inside the radical. ***If there’s a coefficient***, the coefficient is multiplied by the square root of the perfect square.

|  |  |
| --- | --- |
| **EXAMPLES** | = = = 15 |
| = = = – 42 |

Independent Practice:

|  |  |
| --- | --- |
| ***Directions: Write the following in simplest radical form.*** | |
| 1) |  |
| 2) |  |
| 3) |  |
| **4)** |  |
| **5)** |  |
| **6)** |  |
| **7)** |  |
| **8)** |  |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Post-State Testing Unit 7 Topic 3 Lesson 3 Homework: Even More Practice Simplifying Radicals**

|  |  |
| --- | --- |
| ***Directions: Write each of the following in simplest radical form.*** | |
| **1)** | **2)** |
| **3)** | **4)** |
| **5)** | **6)** |
| **7)** | **8)** |
| **9)** | **10)** |
| **11)** | **12)** |
| **13)** | **14)** |
| **15)** | **16)** |
| **17)** | **18)** |
| **19)** | **20)** |

**Reviews:**

**Pythagorean Theorem, Polynomials, and Simplifying Radicals,**

**to prepare for upcoming TEST.**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_**

**Review #1: Pythagorean Theorem, Polynomials & Radicals**

**In #1-2, do (yes or no) the three sides form a right triangle? Show ALL steps to answer the question.**

**1**

**3 10**

**1)** **2)**

**11 14**

**9**

**In #3-6, find the length of the missing side to the nearest tenth. Show ALL steps to answer the question.**

**?**

**11 15**

**3)** **4)**

**7.1**

**8.5 ?**

**? 16**

**7**

**5) 6) a = 13, b = 6, c = ?**

**7) The state of Colorado is shaped like a rectangle. It’s length is**

**387 miles and it’s 475 miles to opposite corners. To the nearest mile,**

**how wide is Colorado?**

**In #8-16, write answer in standard form.**

**8)** Add: (b3 + 3b2 – 8) + (-b3 + 3b + 11)  **8) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**9)** Add: (x + 2y2) + (2y2 - 5x + 2y) + (y2 - 3y)  **9) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10)** Subtract:(3w3 + 5w2) - (w3 **-** 9w2 **+** 5w - 1) **10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**11)** Subtract: 9y – (3y2 + 2y – 7) **11) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**12)** Multiply: -3yz(6y2z + 7yz2 – 5yz + 11) **12) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**13)** Multiply:2u2(2u4 – 3u3 + 2u) **13) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In #14-16, use the area method (draw box) to multiply.**

**14)** Multiply: (b – 6)(b – 8) **14) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**15)** Multiply:(2c + 4)(3c – 2) **15) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**16)** Multiply: (e2 – 2e + 3)(2e2 – e + 1) **16) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In 17-20, simplify the radical. Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144.**

**17) **

**18) **

**19) **

**20) **

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_**

**Review #2: Pythagorean Theorem, Polynomials & Radicals**

**In #1-2, do (yes or no) the three sides form a right triangle? Show ALL steps to answer the question.**

**9.6**

**7.2 12**

**1)** **2)**

**6 7.5**

**4.5**

**In #3-6, find the length of the missing side to the nearest tenth. Show ALL steps to answer the question.**

**?**

**10 14**

**3)** **4)**

**? 15**

**7.7**

**6**

**7 ?**

**5) 6) a = 10, b = 5, c = ?**

****

**7) A tent is supported by a guy rope tied to**

**a stake, as shown in the diagram. What is**

**the length of the rope?**

**In #8-16, write answer in standard form.**

**8)** Add: (b3 + 2b2 + 7) + (b3 + 2b + 10)  **8) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**9)** Add: (2x + y2) + (2y2 - 4x - y) + (y2 - 2y)  **9) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10)** Subtract:(2w3 - 4w2) - (w3 **+** 8w2 **+** 4w - 10) **10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**11)** Subtract: 8y – (4y2 + y + 17) **11) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**12)** Multiply: -2yz(5y2z - 6yz2 – 4yz + 10) **12) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**13)** Multiply:-u2(12u4 – 2u3 - u) **13) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In #14-16, use the area method (draw box) to multiply.**

**14)** Multiply: (b – 5)(b – 7) **14) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**15)** Multiply:(2c - 3)(2c – 7) **15) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**16)** Multiply: (3e2 – e - 2)(2e2 – e - 2) **16) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In 17-20, simplify the radical. Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144.**

**17) **

**18) **

**19) **

**20) **

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_**

**Review #3: Pythagorean Theorem, Polynomials & Radicals**

**In #1-2, do (yes or no) the three sides form a right triangle? Show ALL steps to answer the question.**

**8**

**5 9.4**

**1)** **2)**

**12.8 16.1**

**9.6**

**In #3-6, find the length of the missing side to the nearest tenth. Show ALL steps to answer the question.**

**?**

**9 12**

**3)** **4)**

**? 12**

**6**

**5**

**7 ?**

**5) 6) a = 9, b = 15, c = ?**

****

**7)**

**Round to nearest whole meter.**

**In #8-16, write answer in standard form.**

**8)** Add: (-2b3 + b2 + 6) + (b3 - b + 9)  **8) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**9)** Add: (x - y2) + (2y2 - 3x - y) + (2y2 - 8y)  **9) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10)** Subtract:(2w3 - 3w2) - (2w3 **-** 7w2 **+** 3w - 9) **10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**11)** Subtract: 18y – (3y2 + y - 15) **11) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**12)** Multiply: -2yz(4y2z - 5yz2 – 3yz + 9) **12) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**13)** Multiply:-2u2(11u4 – u3 – u2) **13) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In #14-16, use the area method (draw box) to multiply.**

**14)** Multiply: (b – 4)(b – 6) **14) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**15)** Multiply:(2c - 1)(3c – 5) **15) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**16)** Multiply: (2e2 – e - 5)(e2 – 6e - 5) **16) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In 17-20, simplify the radical. Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144.**

**17) **

**18) **

**19) **

**20) **

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_**

**Review #4: Pythagorean Theorem, Polynomials, & Radicals**

**In #1, do (yes or no) the three sides form a right triangle? Show ALL steps to answer the question.**

**1)**

**12.8 16**

**9.6**

**In #2-3, find the length of the missing side to the nearest tenth. Show ALL steps to answer the question.**

**2) 3) a = 12, b = 18, c = ?**

**? 15**

**8**



****

**4)**

**Round to the nearest tenth of a foot.**

**In #5-8, write answer in standard form.**

**5)** Add: (-3b3 + 2b2 - 6) + (4b3 - 3b + 9) **5) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**6)** Sub:(4w3 - 3w2 + 6w) - (5w3 **+** 9w2 **-** 3w - 3) **6) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**7)** Multiply: -4yz2(3y2z - 6yz2 – 2yz + 8) **7) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In #8-9, use the area method (draw box) to multiply.**

**8)** Multiply:(4c - 5)(3c + 8) **8) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**9)** Multiply: (2e2 – 3e - 4)(e2 – 2e - 3) **9) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**In 10, simplify the radical. Perfect Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144.**

**10)  10) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End:**

**Activity, Reviews, and Pre-Tests**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Cartoon Dilation**

**Materials**: Cartoon, graph paper, ruler, scissors, tape, pencil, and colored pencils.

**1)** Decide if your cartoon is to be oriented horizontally or vertically and turn your graph paper in

the same manner.

**2)** ***Before taping*** your cartoon, make sure it fits **exactly** onto the grid lines, meaning there is **NO**

**overlap on any side**; if there **IS** overlap, cut the cartoon to fit **exactly on** the gird lines. Then, using

one rolled-up piece of tape on the back, TAPE the cartoon to your graph paper in the upper left-hand

or right-hand corner, again, making sure that it fits exactly on the grid lines.

**3)** Using your pencil and ruler, lay your ruler **on top of the cartoon** and lightly, following the blue

lines on the graph paper, draw vertical and horizontal lines onto the top of the cartoon, creating a

**grid on your cartoon**.

**4)** Count the number of boxes that your cartoon uses vertically and horizontally and write these

numbers on the side and bottom (or side and top) of your cartoon.

**5)** Look at the remaining space on your graph paper and count the number of available spaces

(boxes) vertically and horizontally. Use this available space to determine the **largest** scale

factor you can use to dilate (enlarge) your cartoon. Scale Factor: \_\_\_\_\_

**6)** Using your scale factor, determine the dilated **(new)** vertical and horizontal size of your enlarged

cartoon; multiply numbers in #4 by your scale factor. Vertical size = \_\_\_\_\_.

Horizontal size = \_\_\_\_\_.

**7)** Using the remaining space on your graph paper, draw a rectangle that has your **new** dimensions

(vertical and horizontal). It should be larger than the original cartoon!

**8)** Using your pencil and ruler, lay your ruler on top of your larger rectangle and lightly draw vertical

**and** horizontal grid lines **using your scale factor**. For example, if your scale factor is **4**, you draw

a line every **4th** line on the graph paper, both vertically **and** horizontally to create a grid.

**9)** Starting in any corner square or box on your original cartoon, ***copy what’s in that square*** or box

***into*** its corresponding **larger** square or box. Remember: you’re making it larger!

**10)** Continue by looking at each and every original square or box and copying its contents into its

corresponding square or box in your new, larger grid.

**11)** Once your cartoon has been completely enlarged, color it, please!

Any questions, please look at the examples posted around the room; they may be able to help!

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Per:\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Math 8: Year-End Comprehensive Practice #1**

**In #1-40, answer all questions; show ALL work.**

**1)** Evaluate: 2.3e + 28z, for e = 9 and z = 23.

**2)** Rewrite into scientific notation: 3785.6

**3)** Write an algebraic expression for the phrase: “four less the product of

five and n”

**4)** Multiply (draw box): 

**5)** Simplify: 

**6)** Evaluate: 

**7)** Divide: 

**8)** If point N(-4,8) is dilated using a scale factor of 2, what are the

coordinates of N’?

**For questions #9-14, use the diagram below.**



**9)** Name a pair of vertical angles.

**10)** Name a pair of complementary angles.

**11)** Name a pair of supplementary angles.

**12)** Name a pair of corresponding angles.

**13)** Name a pair of alternate interior angles.

**14)** If the m6 = 123°, find the m1.

**15)** Complete the pattern below by filling in the next three terms:

2, 4, 2, 6, 2, \_\_\_\_, \_\_\_\_, \_\_\_\_

**16)** If mABC = 11°, find its complement.

**17)** If point A(2,5) is rotated 180° about the origin, what are the

coordinates of A’?

**18)** Subtract: 

**19)** If point C(4,3) is reflected over the y-axis, what are the coordinates

of C’?

**20)** If the volume (*V*) of a cylinder is calculated by the formula ,

find the *V, to the nearest hundredths place,* of a cylinder whose diameter = 6” and

height = 6”.

**21)** Yes or No: Is the ordered pair (-1,-2) a solution for the equation

?

**22)** Multiply: 

**23)** Find the slope of the line between the points (6,4) and (4,-2).

**24)** Add: 

**25)** In the equation, , what is the slope?

**26)** Add; write answer in scientific notation: (1.45 x 102) + (3.807 x 104)

**27)** Simplify: 

**28)** Write the ***equation*** of the line in slope-intercept form (y = mx + b)

with m = 3 and going through the point (2,-4).

**29)** Multiply: -4ax2(2ax3 – 3a2x + 4ax)

**30)** Subtract; write answer in scientific notation:

(9.87 x 105) – (4.018 x 104)

**31)** Simplify: 

**32)** Solve the equation: 5 – a = -44

**33)** If f(*g*) = *g*2 – *g* + 4, find f(-2).

**34)** Write and solve a proportion to find the missing length, y, of the two

similar triangles:

5 mm 8 mm

7.5

y

**35)** Use the Pythagorean Theorem to find the length of the missing side

(b) in triangle TRY. Round to the nearest tenth, if necessary.



**36)** Trapezoid ABCD is at the following points: A(4,-7), B(7,-4), C(6,-1),

D(2,-1).

**a)** Draw and label trapezoid ABCD.

**b)** ***Translate*** ABCD 6 units left and 7 units up. Draw and label A’B’C’D’.



**37)** Solve the equation: 

**38)** Two angles are corresponding and have the measures (8x + 6)° and

(10x - 18)°. ***Write*** and ***solve*** an equation to find x. Then use your

value for x to find the measure of the angles.

**39) a.** Graph the system (both) of equations on the coordinate plane:



 and determine its solution (point where they cross).



**b.** Name the point of solution for the system: ( , )

**40)** Solve the system using substitution: 

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End Comprehensive Practice #2**

**In #1-40, answer all questions; show ALL work.**

**1)** Evaluate: 3.25r + 9s, for r = 4 and s = 1.

**2)** Write an algebraic expression for the phrase: “6 less than the quotient

of *x* and 10”.

**3)** Multiply (draw box): 

**4)** Divide: 

**5)** Simplify: 

**6)** Solve the equation: 

**7)** Evaluate: 

**8)** Rewrite into scientific notation: 1001.5

**9)** Complete the pattern below by filling in the next three terms:

-2, 1, 5, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**10)** If point C(6,-1) is reflected over the y-axis, find the coordinates

of C’.

**For questions #11-16, use the diagram below.**

****

**11)** Name a pair of vertical angles.

**12)** Name a pair of complementary angles.

**13)** Name a pair of supplementary angles.

**14)** Name a pair of corresponding angles.

**15)** Name a pair of alternate interior angles.

**16)** If the m2 = 100°, find the m7.

**17)** If mABC = 35°, find its supplement.

**18)** If point A(-2,8) is rotated 180° about the origin, find the coordinates

of A’.

**19)** If point N(8,-12) is dilated using a scale factor of 1/4, what are the

coordinates of N’?

**20)** If the volume (*V*) of a sphere is calculated by the formula: ,

find the *V, to the nearest hundredths place,* of a sphere whose diameter = 15”.

**21)** Yes or No: Is the ordered pair (2, 7) a solution for the equation

? Justify your answer.

**22)** Find the slope of the line between the points (-2,5) and (3,-7).

**23)** In the equation , what is the y-intercept?

**24)** If , find *f*(0).

**25)** Add: 

**26)** Subtract: 

**27)** Multiply: 

**28)** Simplify: 

**29)** Multiply; write answer in scientific notation: (3.009 x 103)(4.2 x 105)

**30)** Write the ***equation*** of the line in slope-intercept form

(y = mx + b)passing through the points: (-1,-3) and (2,-15).

**31)** Multiply: 5xy2(3y3 – 4x2 – 5xy + 6)

**32)** Simplify: 

**33)** Divide; write answer in scientific notation: 

**34)** Solve the equation: 

**35)** Two angles are vertical and have the measures (2x+1)° and (5x-14)°.

***Write*** and ***solve*** an equation to find x. Then use your value for x to

find the measure of the angles.

**36)** Solve the system of equations using elimination: 

**37)** Find the length of the missing side (a) in triangle TRY, to the nearest

whole number.



 **38) a.** Graph the system of equations on the coordinate plane: 

**b.** Name the ordered pair that is a solution for the system: ( , )

**39)** Pentagon ABCDE is at the following points: A(4, 2), B(1, 5), C(2, 8),

D(6, 8), E(7, 5).

**a)** Draw and label pentagon ABCDE.

**b)** ***Rotate*** ABCDE 90° clockwise about the origin. Draw and

label A’B’C’D’E’.



**40) *Write*** and ***solve a proportion*** to find the missing length, x, of the

two similar trapezoids.

4 cm 9.6 cm

x 21.6 cm

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End Comprehensive Practice #3**

**In #1-40, answer all questions; show ALL work.**

**1)** Evaluate: , for n=6 and q=10.

**2)** Write an algebraic expression for the phrase: “the sum of x and 8

divided by 10”

**3)** Multiply (draw box): 

**4)** Divide: 

**5)** Simplify: 

**6)** Evaluate: 

**7)** Rewrite into scientific notation: 12.006

**8)** Complete the pattern below by filling in the next three terms:

1000, 500, 250, 125, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**9)** If point C(-6, -1) is reflected over the x-axis, what are the

coordinates of C’?

**10)** If point A(2, -8) is rotated 180° about the origin, what are the

coordinates of A’?

**11)** If point N(10, -20) is dilated using a scale factor of 1/5, what are

the coordinates of N’?

**For questions #12-18, use the diagram below.**

****

**12)** Name a pair of vertical angles.

**13)** Name a pair of complementary angles.

**14)** Name a pair of supplementary angles.

**15)** Name a pair of corresponding angles.

**16)** Name a pair of alternate interior angles.

**17)** If the m14 = 83°, find the m11.

**18)** If mABC = 84°, find its complement.

**19)** If the area (*A*) of a trapezoid is calculated by the formula

, find the *A* of a trapezoid whose height = 18” and

bases = 5.5” and 7.5”.

**20)** Yes or No: Is the ordered pair (7,1) a solution for the equation

?

**21)** Find the slope of the line between the points (8,-2) and (-4,8).

**22)** In the equation, , what is the slope?

**23)** If , find *f*(-8).

**24)** Add: 

**25)** Subtract: 

**26)** Multiply: 

**27)** Simplify: 

**28)** Add; write answer in scientific notation: (3.009 x 103) + (4.2 x 105)

**29)** Write the ***equation*** of the line in slope-intercept form

(y = mx + b) passing through the points: (4,-3) and (8,0).

**30)** Multiply: 6xy3z(2y3z – 5x2yz – 4xyz + 8)

**31)** Simplify: 

**32)** Divide; write answer in scientific notation: 

**33)** Draw a box below to multiply (5x2 - 3x + 2)(2x2 + 4x - 5).

**34)** Solve the equation: 

**35)** Solve the system of equations using elimination: 

**36)** Two angles are alternate interior and have the measures (2b - 8)° and

(-b + 7)°. ***Write*** and ***solve*** an equation to find x. Then use your value

for x to find the measure of the angles.

**37) a.** Graph the system of equations on the coordinate plane: 



**b.** Name the solution of this system of equations: ( , ).

**38)** Find the length of the missing side (c) in triangle TRY, to the nearest

whole number.



**39)** Pentagon TWIRL is at the following points: T(4,2), W(1,5), I(2,8),

R(6,8), L(7,5).

**a)** Draw and label pentagon TWIRL.

**b)** ***Reflect*** TWIRL across the line y = x. Draw and label T’W’I’R’L’.



**40) *Write*** and ***solve a proportion*** to find the missing length, z, of the

two similar figures.

1.3 cm 3.25 cm

Z 8.5 cm

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End Pre-Test 1a**

**\_\_\_\_\_ 1)** Simplify: 

**A.**  **B.**  **C.**  **D.** 

**\_\_\_\_\_ 2)** Evaluate:  if  and 

**A.** 318 **B.** –318 **C.** –52 **D.** –2

**\_\_\_\_\_ 3)** Add: (4x4 – 5x3 + 3x2 – 6x + 7) + (2x4 – 5x2 – 7x – 6)

**A.** 6x4 –13 x2 – x + 2 **B.** 6x4 – 5x3 + 2x2 – x + 1

**C.** 6x4 – 5x3 – 2x2 – 13x – 13 **D.** 6x4 – 5x3 – 2x2 – 13x + 1

**\_\_\_\_\_ 4)** Subtract: (7y2 + 5y – 7) – (–2y2 + 5y + 7)

**A.** 5y2 + 10y **B.** 9y2 – 14 **C.** 9y2 **D.** 5y2 + 11y – 4

**\_\_\_\_\_ 5)** Multiply: 

**A.**  **B.**  **C.**  **D.** 

**\_\_\_\_\_ 6)** Simplify: 

**A.**  **B.**  **C.**  **D.** 

**\_\_\_\_\_ 7)** Multiply: –12c2d(2cd2 + 2cd – 4d + 8)

**A.** –24c3d3 – 24 c3d2 + 46c2d2 – 98c2d **B.** –6c5d3 – 8 c4d2 – 10cd2 + 8 c3d

**C.** –24c3d3 – 24 c3d2 + 48c2d2 – 96c2d **D.** –6c5d3 – 8c4d2 + 10c3d2 + 8 c3d

**\_\_\_\_\_ 8)** Use the area method (draw a box) to multiply: (3a – 3)(5a + 4)

**A.** 15a2 – 3a – 12 **B.** 15a2 – 27a – 12 **C.** 15a2 + 3a – 12 **D.** 15a – 3a + 12

**\_\_\_\_\_ 9)** Adult humans have, on average, 15,000,000,000 red blood cells. What is this number written in

scientific notation?

**A.** **B.** **C.** **D.**

**\_\_\_\_\_ 10)** The diameter of a red blood cell is approximately . What is the diameter expressed

in standard form?

**A.** 69,000 **B.** 0.0069 **C.** 0.00069 **D.** 6.9000

**\_\_\_\_\_ 11)** Calculate  and write answer in scientific notation.

**A.**  **B.**  **C.**  **D.** 

**\_\_\_\_\_ 12)** There are approximately 40,000,000 people living in North Hamburg. The population of

Diggsville is approximately people. Which statement best summarizes these facts?

**A.** The population of North Hamburg is approximately 2 times the population of Diggsville.

**B.** The population of North Hamburg is approximately 20 times the population of Diggsville.

**C.** The population of Diggsville is approximately 5 times the population of North Hamburg.

**D.** The population of Diggsville is approximately 50 times the population of North Hamburg.

**In #13-15, solve the equation**.

**\_\_\_\_\_ 13)** 

**A.** *x* = 64 **B.** *x* = –16 **C.** *x* = 16 **D.** *x* = –64

**\_\_\_\_\_ 14)** 

**A.** *x* = 0 **B.** *x* = 4 **C.** *x* = 7 **D.** *x* = –7

**\_\_\_\_\_ 15)** 

**A.** *x* = 0 **B.** *x* = 4 **C.** *x* = 8 **D.** No solution

**\_\_\_\_\_ 16)** The volume of a rectangular prism (*V* = *lwh*) is 1047.2 cubic inches. If the length of the prism

is 8.5 in and the height is 14 inches, calculate the width.

**A.** 12.97 inches **B.** 16.5 inches **C.** 8.8 inches **D.** 1.1 inches

**\_\_\_\_\_ 17)** You cleaned a community park for 8 hours and earned $58.00. How much did you earn per

hour?

**A.** $464 **B.** $7.25 **C.** $8.25 **D.** $50

**\_\_\_\_\_ 18)** The temperature at noon was 33°F. By 3 AM the temperature registered -14°F. How much

did the temperature change?

**A.** 47°F **B.** 19°F **C.** –37°F **D.** –47°F

**\_\_\_\_\_ 19)** Solve the following system of equations. 

**A.** (–2, –14) **B.** (2, –14) **C.** (–6, –18) **D.** (12, –18)

**\_\_\_\_\_ 20)** The sum of two integers is 14. The difference of the two integers is 10. Find the two integers.

**A.** (10, 4) **B.** (12, 2) **C.** (7, 7) **D.** (6, 8)

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End Pre-Test 2a**

**1)** Simplify: 

**A.**  **B.**  **C.**  **D.** 

**2)** Evaluate:  if  and 

**A.** 318 **B.** –318 **C.** 17 **D.** 1

**3)** Add: (4x4 – 5x3 + 3x2 – 6x + 7) + (2x4 + 5x3 + 5x – 5)

**A.** 6x4 + 3 x2 – x + 2 **B.** 6x4 – 5x3 + 2x2 – x + 1

**C.** 6x4 – 5x3 – 2x2 – 13x – 13 **D.** 6x4 – 5x3 – 2x2 – 13x + 1

**4)** Subtract: (7y2 + 5y – 7) – (2y2 – 6y + 7)

**A.** 5y2 + 10y **B.** 9y2 – 14 **C.** 9y2 **D.** 5y2 + 11y – 14

**5)** Multiply: 

**A.**  **B.**  **C.**  **D.** 

**6)** Simplify: 

**A.**  **B.**  **C.**  **D.** 

**7)** Multiply: –3c2d(2c3d2 + 2c2d – 4d + 8)

**A.** –24c3d3 – 24 c3d2 + 46c2d2 – 98c2d **B.** –6c5d3 – 6c4d2 + 12c2d2 – 24 c2d

**C.** –24c3d3 – 24 c3d2 + 48c2d2 – 96c2d **D.** –6c5d3 – 6c4d2 + 12c3d2 – 24 c3d

**8)** Use the area method (draw a box) to Multiply: (3a – 3)(5a – 4)

**A.** 15a2 – 3a – 12 **B.** 15a2 – 27a + 12 **C.** 15a2 + 3a – 12 **D.** 15a – 3a + 12

**9)** Adult humans have, on average, 11,000,000 white blood cells. What is this number written in

scientific notation?

**A.** **B.** **C.** **D.**

**10)** The radius of a red blood cell is approximately . What is the radius expressed in

standard form?

**A.** 34,500 **B.** 0.000345 **C.** 0.00034 **D.** 3.45000

**11)** Calculate  and write answer in scientific notation.

**A.**  **B.**  **C.**  **D.** 

**12)** There are approximately 4,000,000 people living in North Hamburg. The population of Diggsville is

approximately people. Which statement best summarizes these facts?

**A.** The population of North Hamburg is approximately 2 times the population of Diggsville.

**B.** The population of North Hamburg is approximately 20 times the population of Diggsville.

**C.** The population of Diggsville is approximately 5 times the population of North Hamburg.

**D.** The population of Diggsville is approximately 50 times the population of North Hamburg.

**In #13-15, solve the equation**.

**13)** 

**A.** *x* = 64 **B.** *x* = –16 **C.** *x* = 16 **D.** *x* = –64

**14)** 

**A.** *x* = 0 **B.** *x* = 4 **C.** *x* = 7 **D.** *x* = –7

**15)** 

**A.** *x* = 0 **B.** *x* = 4 **C.** *x* = 8 **D.** No solution

**16)** The volume of a rectangular prism is 1963.5 cubic inches. If the length of the prism is 8.5 in and the

width is 14 inches, calculate the height.

**A.** 12.97 inches **B.** 16.5 inches **C.** 8.8 inches **D.** 1.1 inches

**17)** You cleaned a community park for 7 hours and earned $57.75. How much did you earn per hour?

**A.** $464 **B.** $7.25 **C.** $8.25 **D.** $50

**18)** The temperature at noon was 33°F. By 3 AM the temperature registered -4°F. How much did the

temperature change?

**A.** 47°F **B.** 19°F **C.** –37°F **D.** –47°F

**19)** Solve the following system of equations. 

**A.** (–2, –14) **B.** (2, –14) **C.** (–6, –18) **D.** (12, –18)

**20)** The sum of two integers is 14. The difference of the two integers is 2. Find the two integers.

**A.** (10, 4) **B.** (12, 2) **C.** (7, 7) **D.** (8, 6)

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End Pre-Test 1b**

**\_\_\_\_\_ 1)** Solve for *x*.

**A.** 45 **B.** 135

**C.** 35 **D.** 60

45° (3x)°

**\_\_\_\_\_ 2)** Find the value of x in the triangle below.

95°

70° (2x – 9)°

**A.** 10 **B.** 15

**C.** 12 **D.** 24

**\_\_\_\_\_ 3)** Triangle R’S’T’ is a dilation of triangle RST.

Triangle RST Triangle R’S’T’

R (2, –6) R’ (5, –15)

S (2, 2) S’ (5, 5)

T (4, –2) T’ (**?**, **?**)

What are the coordinates of point T’ ?

**A.** (4, –1) **B.** (10, –10) **C.** (8, –4) **D.** (10, –5)

**\_\_\_\_\_ 4)** The coordinates of A are (–3, 4). Determine the coordinates of A’ after a 90° clockwise

rotation.

**A.** (–4, –3) **B.** (3,4) **C.** (–4,3) **D.** (4,3)

**\_\_\_\_\_ 5)** Solve for *x*: .

**A.** *x* = 18 **B.** *x* = 15 **C.** *x* = 16 **D.** *x* = 10

**\_\_\_\_\_ 6)** A brick layer can lay 36 bricks in 2 hours. How many bricks would he lay in an 8-hour day?

**A.** 120 bricks **B.** 72 bricks **C.** 18 bricks **D.** 144 bricks

**\_\_\_\_\_ 7)** Find the slope  of the line passing through the points:  and .

**A.**  –3 **B.** 1 **C.** 3 **D.**  4

**\_\_\_\_\_ 8)** Write the equation of the line graphed below.



**A.**  **C.** 

**B.**  **D.** 

**\_\_\_\_\_ 9)** A system of equations is graphed on the coordinate plane below.



The solution to this system is:

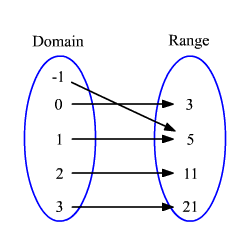
**A.** (3, 2) **C.** (4, 2)

**B.** (–4, –2) **D.** (0, 0)

**\_\_\_\_\_ 10)** Determine whether the following table represents a function.

|  |  |
| --- | --- |
| **x** | **y** |
| 1 | 2 |
| 2 | 5 |
| 3 | 8 |
| 5 | 14 |
| 1 | 20 |

**A.** Yes **B.** No



**\_\_\_\_\_ 11)** Determine if the following relation is a function.

**A.** Yes **B.** No

**\_\_\_\_\_ 12)** Determine the equation of the line in the graph below.



**A.**  **B.** 

**C.**   **D.** 

**\_\_\_\_\_ 13)** Write the equation of the line, in y = mx + b form, that passes through the point (-3, -9) and has

a slope of 2.

**A.**  **B.**  **C.**  **D.** 

**\_\_\_\_\_ 14)** Which equation is a linear function when graphed on a coordinate plane?

**A.**  **B.**  **C.**  **D.** 

**\_\_\_\_\_ 15)** To the nearest tenth, use a2 + b2 = c2 to find the length of the hypotenuse of a right triangle

whose legs measure 10 and 12?

**A.** 15.6 **B.** 6.6 **C.** 11.0 **D.** 14.8

**\_\_\_\_\_ 16)** Use a2 + b2 = c2 to determine the missing leg of a right triangle, to the nearest tenth, with a

hypotenuse of 16 and one leg 5.

**A.** 11 **B.** 15 **C.** 15.2 **D.** 16.8

**\_\_\_\_\_ 17)** Use a2 + b2 = c2 to determine whether or not side lengths of 9, 40 and 41 make a right triangle.

**A.** Yes **B.** No

**\_\_\_\_\_18)** Simplify: 

**A.** 4 **B.** 8 **C.** 2 **D.** 4

**\_\_\_\_\_ 19)** Simplify: 

**A.** 64 **B.** 8 **C.** 2 **D.** 

**\_\_\_\_\_ 20)** Simplify: 

**A.**  **B.**  **C.**  **D.** 

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Year-End Pre-Test 2b**

**1)** Solve for *x*.

**A.** 45 **B.** 135

**C.** 35 **D.** 60

75° (3x)°

**2)** Find the value of x in the triangle below.

97°

72° (2x – 9)°

**A.** 10 **B.** 15

**C.** 12 **D.** 24

**3)** Triangle R’S’T’ is a dilation of triangle RST.

Triangle RST Triangle R’S’T’

R (2, –6) R’ (5, –15)

S (2, 2) S’ (5, 5)

T (–4, –2) T’ (**?**, **?**)

What are the coordinates of point T’ ?

**A.** (4, –1) **B.** (–10, –5) **C.** (8, –4) **D.** (10, –5)

**4)** The coordinates of A are (–4, 3). Determine the coordinates of A’ after a 90° clockwise rotation.

**A.** (–4, –3) **B.** (3,4) **C.** (–4,3) **D.** (4,3)

**5)** Solve for *x*: .

**A.** *x* = 18 **B.** *x* = 15 **C.** *x* = 16 **D.** *x* = 10

**6)** A brick layer can lay 30 bricks in 2 hours. How many bricks would he lay in an 8-hour day?

**A.** 120 bricks **B.** 72 bricks **C.** 18 bricks **D.** 144 bricks

**7)** Find the slope of the line that passes through the following points:  and .

**A.**  –3 **B.** 1 **C.** 3 **D.**  4

**8)** Write the equation of the line graphed below.



**A.**  **C.** 

**B.**  **D.** 

**9)** A system of equations is graphed on the coordinate plane below.



The solution to this system is:

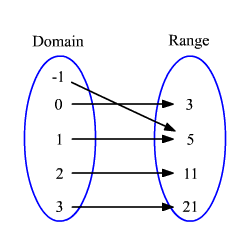
**A.** (3, 2) **C.** (4, 2)

**B.** (–4, –2) **D.** (0, 0)

**10)** Determine whether the following table represents a function.

|  |  |
| --- | --- |
| **x** | **y** |
| 1 | 2 |
| 2 | 5 |
| 3 | 8 |
| 5 | 14 |
| 7 | 20 |

**A.** Yes **B.** No



**11)** Determine if the following relation is a function.

**A.** Yes **B.** No

**12)** Determine the equation of the line in the graph below.



**A.**  **B.** 

**C.**   **D.** 

**13)** Write the equation of the line that passes through the point (-3, 4) and has a slope of 2.

**A.**  **B.**  **C.**  **D.** 

**14)** Which equation is a linear function when graphed on a coordinate plane?

**A.**  **B.**  **C.**  **D.** 

**15)** To the nearest tenth, how long is the hypotenuse of a right triangle whose legs measure 10 and 10.9?

**A.** 15.6 **B.** 6.6 **C.** 11.0 **D.** 14.8

**16)** Determine the missing leg of a right triangle, to the nearest tenth, with a hypotenuse of 17.5 and one

leg 5.

**A.** 11 **B.** 15 **C.** 15.2 **D.** 16.8

**17)** Determine whether or not side lengths of 9, 40 and 42 make a right triangle.

**A.** Yes **B.** No

**18)** Simplify: 

**A.** 4 **B.** 8 **C.** 2 **D.** 4

**19)** Simplify: 

**A.** 64 **B.** 8 **C.** 2 **D.** 

**20)** Simplify: 

**A.**  **B.**  **C.**  **D.** 

