**Unit 1 Review**

**Function Notation**

A function is a mathematical relation so that every \_\_\_\_\_ in the \_\_\_\_\_\_\_ corresponds with

one \_\_\_\_\_\_ in the \_\_\_\_\_\_\_\_. To evaluate a function, f(x), substitute the \_\_\_\_\_\_\_\_\_\_\_ for every x and calculate.

*Example: Evaluate f(-3) for f(x) = 100(2)x.*

**Transformation**s

Transformations are function rules that applied to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to create a new shape.

Certain transformation preserve rigid motion and produce congruent figures: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or any combination of these.

Other transformations do not preserve rigid motion, so they do not produce congruent figures.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ produce similar figures, while \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are not congruent or

similar.

To prove if a transformation preserves rigid motion, you can use the distance formula:

Rules for transformations:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Transform-ation** | **Reflection Over the x-axis** | **Reflection Over the y-axis** | **Reflection Over the y=x line** | **Rotation of 900 Clockwise** | **Rotation of 900 Counter-clockwise** | **Rotation of 1800** | **Trans-lation** |
| **Written Description** | Shape flips over the x-axis (flips over the horizontal axis) |  |  |  |  |  |  |
| **Picture** | Image result for reflection over x axis |  |  |  |  |  |  |
| **Function Rule** | f(x, y) →(x, -y) |  |  |  |  |  |  |

To determine the coordinates for a dilation, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ each point times the scale factor of the dilation.

Concept Questions:

1. Why do rotations, reflections, and translations preserve congruence while dilations do not?

2. Why do adding and subtracting translate points, while multiplying dilates points?

**Unit 1 Review Problems**

1. 4.

 5. What are the coordinates of the point (2, -3) after

2. is it reflected over the x-axis and rotated 900

 counterclockwise?

6.

 If the triangle above is reflected over the x-axis

 and dilated by a scale factor of 3, what is the length

3. of the new image AC? Round to the nearest tenth.

 A) 2.8 units B) 8.5 units

 C) 18.2 units D) 25.5 units

**Unit 2 Review**

**Polynomial Operations**

Multiplying: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ terms times EVERY other term

 To distribute \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, write the polynomial in parentheses and \_\_\_\_\_\_\_\_\_\_\_\_\_.

Adding or subtracting: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 Remember, you can NOT operate with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the calculator!

 Example 1: (2x – 3)3

**Factoring/Dividing**

GCF x2 + bx + c ax2 + bx + c Perfect Squares

10x2 – 5x x2 – 9x – 22 3x2 – 13x – 10 x2 – 49 5x3 + 500x

**Quadratic Formula**

 You MUST use the quadratic formula for \_\_\_\_\_\_\_\_\_\_\_\_\_\_solutions or \_\_\_\_\_\_\_\_\_\_\_\_\_ solutions in radical form.

Example: Solve 3x2 + 9x = -11

**Completing the Square**

 To complete the square and rewrite quadratics, use \_\_\_\_\_\_\_\_\_ to find the correct c.

 Then, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the parentheses and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the parentheses.

 Finally, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 Example: Complete the square to find the vertex of y = x2 – 12x – 15. Then, solve the equation.

**Solving Equations/Systems**

 Solutions to all equations and systems are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the graph.

 If you graph both sides of an equation (or both equations in a system) in the calculator, use:

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to find the solution. (Don’t forget to adjust your window range if necessary.)

**Real-World Quadratics**

 x-intercept: Where \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = 0

 y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ value, where \_\_\_\_\_ = 0

 Maximum/minimum value: The \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_ y-coordinate (output)

 Example: A rocket is launched and follows the function h(t) = -16t2 + 500t + 30 for its first 10 seconds.

a) From what height is the rocket launched? b) What is the highest height the rocket reaches?

c) When does the rocket hit the ground?

Concept Questions:

1. Why is a parabola shaped like a U, and why does it have a line of symmetry through the vertex?

2. What is the easiest way to solve quadratics? Explain.

3. Why is x2 - 49 not equal to (x - 7)(x - 7)?

**Unit 2 Practice Problems**

1. 2. Solve: 8x2 + 3x = -7



3. 4.

5.

 6.

7.

**Unit 3 Review**

**Simplifying Radicals**

To simplify a number or expression under a square root, determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

of the radicand under the radical, write the expression by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the two radicals, and take the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the perfect square. For example:

 $\sqrt{72}$ = $\sqrt{36}$ • $\sqrt{2}$ = 6$\sqrt{2}$ Examples: $\sqrt{150}$ $\sqrt{60x^{8}}$

**Rational Exponents (with fractions)**

 The numerator of the exponent is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 of the radicand.

 The denominator of the exponent is the \_\_\_\_\_\_\_\_\_\_\_\_.

**Radical Equations**

To solve a radical equation (with a variable inside a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_), first use inverse operations to

get the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by itself.

Then, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ both sides to pull the variable out of the radical.

Finally, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to get the variable by itself, if necessary.

Example: 5$\sqrt{3x+2}$ + 19 = 99

**Radical Functions**

 Domain - \_\_\_\_\_\_\_\_\_\_\_ Range - \_\_\_\_\_\_\_\_\_\_\_

 x-intercept - \_\_\_\_\_\_\_\_\_ y-intercept - \_\_\_\_\_\_\_\_\_\_

 minimum point - \_\_\_\_\_\_\_\_\_

**Inverse Variation**

 Inverse variation results when two variables are \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 to equal a constant, *k*.

 The relationship is that as one variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the

 other variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Concept Questions:

1. Why are the domain and range of the parent radical function non-negative numbers?

2. Using rational exponents, explain why a square root and an exponent of 2 are inverse operations.

3. What are the main differences between direct and inverse variation?

**Unit 3 Practice Problems**

**1. 2.**



3.

4.



5.

**Unit 4 Review**

**Triangle Congruence**

Two triangles are congruent when all \_\_\_\_\_\_\_\_\_ and all \_\_\_\_\_\_\_\_\_\_\_ are congruent.

We can prove that two triangles are congruent if we know that certain parts of the triangles are congruent by

proving congruence postulates: \_\_\_\_\_\_\_\_\_ , \_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ (for right triangles)

Examples:

1. 2. 3.

**Similar Triangles**

ANY shapes are similar if their sides are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If you divide the length of the corresponding sides, the ratios should be \_\_\_\_\_\_\_\_\_\_\_\_\_\_. The ratio is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 Triangles are similar if \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are equal. This is the \_\_\_\_\_ similarity postulate.

 You can use similar shapes to find missing lengths of sides.

 Example: Find x.

**Other Geometric Theorems**

The midsegment of a triangle is \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the opposite side.

Side-Splitter Theorem - Any segment in a triangle \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to a side divides the sides into proportional parts.

All angles in a triangle add to \_\_\_\_\_\_\_\_\_\_, and isosceles triangles have \_\_\_\_\_\_ equal angles and sides.

We need to know these theorems, but we also need to be able to PROVE these theorems.

Given: CD is the perpendicular bisector of AB.

Prove: ΔABC is isosceles.

 Theorems about angles:

|  |  |
| --- | --- |
| Equal Angles | Supplementary Angles |
| **Vertical Angles** |  | **Linear Pair** |  |
| **Corresponding Angles** |  | **Consecutive Interior Angles** |  |
| **Alternate Interior Angles** |  |  |  |
| **Alternate Exterior Angles** |  |  |  |
|  |  |  |  |

Concept Questions:

1. What are the similarities and differences between similar and congruent triangles?

2. In your own words, what does it mean to “prove” that two triangles are congruent using one of the congruence postulates?

3. What is the scale factor of the similar triangles created by the midsegment of a triangle? How do you know?

**Two More Sample Problems!**



**Unit 4 Practice Problems**

1. 2.



3. 4.

5. 6. In the picture below, what postulate proves ΔMPO $\tilde{=}$ ΔQNO?

 A) SSS B) SAS C) ASA D) AAS

**Unit 5 Review**

**Pythagorean Theorem**

Leg2 + Leg2 = Hypotenuse2

Don’t forget to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if necessary for your answer.

**Special Right Triangles (45-45-90 and 30-60-90)**

 The altitude of an equilateral triangle forms two \_\_\_\_\_\_\_\_\_\_\_\_.

 The diagonal of a square forms two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Trigonometric Ratios (MAKE SURE YOU ARE IN DEGREE MODE IN YOUR CALCULATOR!!!)**

Sin = ------------------------ Cos = -------------------------- Tan = ---------------------------

The three trigonometric ratios apply to the \_\_\_\_\_\_\_\_\_\_\_\_\_. The side lengths can be any size, but the ratios

will hold for that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

To set up problems to solve for the length of a side:

1. Determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ you are working with

2. Determine the appropriate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Solve to isolate the variable

To set up problems to solve for an angle measure:

1. Determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ you are working with

2. Determine the appropriate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ trig ratio (sin-1, cos-1, tan-1)

Concept Questions:

1. Why do trig ratios hold for angles when the side lengths can be any length?

2. How do special right triangle rules relate to the Pythagorean Theorem?

**Unit 5 Review Problems**

**1. 2. 3.**

4. 5.

 6.

**Unit 6 Review**

**Probability Concepts**

Probability - A value between \_\_\_\_\_ and \_\_\_\_\_ that determines the likelihood of a specific event occurring

Experimental Probability - The actual probability that occurs from an experiment or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Theoretical Probability - The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ probability based on the mathematical likelihood of an event occurring

The more \_\_\_\_\_\_\_\_\_\_\_\_\_ that occur for a given experiment, the closer the experimental probability will be to the theoretical probability.

**Probability Terms**

Independent Events - Events whose outcomes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by other or previous events

Dependent Events - Events whose likelihood \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by other events

Mutually Exclusive - Events or outcomes that cannot \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Conditional Probability - When the likelihood of an event is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on another event occurring

 (represented as B│A, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Probability Formulas**

Addition Rule (Mutually Exclusive Events) - When two events, A and B, are mutually exclusive, the probability that A or B will occur is the sum of the probability of each event. P(A or B) = P(A) + P(B)

Addition Rule (Non-Mutually Exclusive Events) - When two events, A and B, are non-mutually exclusive, the probability that A or B will occur is: P(A or B) = P(A) + P(B) - P(A and B)

Multiplication Rule (Independent Events) - When two events, A and B, are independent, the probability of both occurring is: P(A and B) = P(A) · P(B)

Multiplication Rule (Dependent Events) - When two events, A and B, are dependent, the probability of both occurring is: 

Concept Questions:

1. What are the differences between the addition and multiplication rules, and when would each apply?

2 Why does experimental probability get closer to theoretical probability as the number of events increases?

**Unit 6 Review Problems**

1. Use this table for problems #3 - 5.

 3. How many total people were surveyed?

2. A) 66 B) 90 C) 156 D) 312

 4. What is the probability that a person likes action

 movies?

 A) ¼ B) 1/3 C) 17/39 D) 22/39

 5. What is the probability that a person is female,

 given that she likes romantic comedies?

 A) 7/44 B) 8/45 C) 37/44 D) 37/45



**A) 3/30 B) 4/15 C) 1/3 D) 11/30**

### 7. Melissa collects data on her college graduating class. She finds that out of her classmates, 60% are brunettes, 20% have blue eyes, and 5% are brunettes and have blue eyes. What is the probability that one of Melissa's classmates will have brunette hair or blue eyes, but not both?

### https://i.gyazo.com/e86c90e279e4dcf86139efac40292136.pngA) 12% B) 75% C) 80% D) 85%

### 8.