**Questions/Work**

**Use a Graph to Solve an Equation**

* An equation is a statement that two expressions are \_\_\_\_\_\_\_\_\_\_\_. The values of x that make the equation true are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* To solve an equation by graphing, write two new equations by setting \_\_\_\_\_\_\_ equal to each in the original equation. Then, you graph the two equations and identify the \_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Each of the x-values is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the original equation.

**Example 1**

**A.** Solve $-3x+20=5$ by graphing.

|  |  |
| --- | --- |
| **Two New Equations:****Solution(s):** | **Graph:** |

**B.** Solve $\left|x-4\right|=\frac{1}{2}x+1$ by graphing

|  |  |
| --- | --- |
| **Two New Equations:****Solution(s):** | **Graph:** |

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

**Topic**: Solving Equations and Inequalities by Graphing

**Essential Question**: What do the differences between the equation of a function and the equation of its parent function tell you about the differences in the graphs of the two functions?

**I CAN…**

 **Level 4**: Construct a real-world scenario that is modeled by an algebraic equation or inequality and solve.

 Level 3: Use graphs and tables to approximate solutions to algebraic equations and inequalities

 Level 2: Understand key terminology as well as well as understand the basic processes of the lesson

 Level 1: With help, I can understand key terminology and work with basic processes of the lesson

**Notes 1-5**

**p.1**

**p. 2**

**Try It!**

**1.** Use a graph to solve the equation.

|  |  |
| --- | --- |
| **a.** $5x-12=3$**Two New Equations:****Solution(s):** | **Graph:** |
| **b.**  $-\left|x-2\right|=-\frac{1}{2}x-2$**Two New Equations:****Solution(s):** | **Graph:** |

**Solve a One-Variable Inequality by Graphing**

**Example 2**

**A.** Solve $x^{2}-4>0$

To solve the inequality, identify the values of x that make the value of the expression $x^{2}-4$ greater than \_\_\_\_\_\_ (positive values for y). Graph the equation $y=x^{2}-4$ by translating the parent function y = \_\_\_\_\_\_ down \_\_\_\_\_\_ units.

Look for the points on the graph where the value of the function is \_\_\_\_\_\_\_\_\_\_\_. You are looking for interval(s) where \_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Solution:**The graph of the function is positive over the intervals \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_. So x < \_\_\_\_\_\_\_ or x > \_\_\_\_\_\_\_\_ |  |

**Questions/Work**

**B.** A motorcycle is 40 mi ahead of a car. The motorcycle travels at an average rate of 40 mph. The car travels at a rate of 60 mph. When will the car be ahead of the motorcycle?

Variable for the number of hours since car started traveling: \_\_\_\_\_\_\_\_

Expression 1 for distance car travels in x hours: \_\_\_\_\_\_\_\_\_

Expression 2 for distance motorcycle travels in x hours: \_\_\_\_\_\_\_\_\_\_

To solve, we need Expression \_\_\_\_\_ (1/2) to be greater than Expression \_\_\_\_\_\_ (1/2)

Inequality: $60x>40x+40$

|  |  |
| --- | --- |
| **Two Equations:****Solution**: The car will be ahead of the motorcycle any time after \_\_\_\_\_\_\_ hours.  |  |

**Try It!**

**2.** Use a graph to solve each inequality

|  |  |
| --- | --- |
| **a.** $x^{2}+6x+5\geq 0$**Two Equations:****Solution**: X $\leq $ \_\_\_\_\_ or X $\geq $ \_\_\_\_\_\_ |  |
| **b.** $x+3>7-3x$**Two Equations:****Solution**: X > \_\_\_\_\_ |  |

**p. 3**

**Questions/Work**

**p. 4**

**Questions/Work**

**Concept Summary**

Solve $\left|3x+5\right|=\frac{1}{3}x+5$

Let $f\left(x\right)= \\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$ and $g\left(x\right)=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **GRAPHS** | Graph each function, and identify the \_\_\_\_ - coordinates of the points of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. One solution appears to be x = \_\_\_\_\_. The second solution appears to be x = \_\_\_\_\_. |
| **TABLE** | Graphs may not always yield integer results. Tables may be used to find solutions. It helps to use technology such as a calculator. You are looking for when the values of both function are **equal**.

|  |  |  |
| --- | --- | --- |
| **X** | **F(x)** | **G(x)** |
| -3.3 | 4.9 | 3.9 |
| -3.2 |  | 3.9333 |
| -3.1 |  | 3.9667 |
| **-3.0** |  |  |
| -2.9 | 3.7 | 4.0333 |

 |

**Written Summary**

**EQ**: What do the differences between the equation of a function and the equation of its parent function tell you about the differences in the graphs of the two functions?

**p. 5**

**Questions**

**p. 6**

**Questions**

**P. 7**

**Questions**

**Questions**

**P. 8**

**Questions**

**Questions**