FOM2 Unit 2 Lesson 4 Transformations of a Parabola Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Transforming a Quadratic Equation Investigation**

What does it mean transforming a Quadratic Equation?

Using a Graphing Calculator complete

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| Function Color1. $y=x^{2} $ Black2. $y=x^{2}+2 $ 3. $y=x^{2}-3$ 4. $y=\left(x-4\right)^{2}$5. $y=\left(x+1\right)^{2}$6. $y= -x^{2}$7. $y=3x^{2}$8. $y= \frac{1}{2} x^{2}$ |

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| Describe the transformation1. Parent Graph 5. 2. 6.3. 7.4. 8. |

**Summary of Transformations:** $y=a\left(x-h\right)^{2}+k$

**k produces a vertical shift \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_ h produces a horizontal shift \_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_**

 if k is positive, the graph moves \_\_\_\_\_\_\_\_\_\_ if h is positive, the graph moves \_\_\_\_\_\_\_\_\_\_\_

 if k is negative, the graph moves\_\_\_\_\_\_\_\_\_\_ if h is negative, the graph moves \_\_\_\_\_\_\_\_\_\_\_

**a causes the graph to get narrower or wider also called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

If $\left|a\right|>1$, the result is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by a scale factor of $\left|a\right|$

If 0 $<|a| <1$, the result is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by a scale factor of $\left|a\right|$

If a is negative, the graph is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over the x-axis

Describe the transformations of the parent graph $y=x^{2}$

1.$ y=\left(x+2\right)^{2}-4$

2. $y=3\left(x-5\right)^{2}+2$

3. $y= -\frac{1}{2}x^{2}+3$

4. $y= \frac{4}{3}x^{2}+7$

5. $y= -3(x-4)^{2}-7$

Write the equation that represents the transformation from the graph $y=x^{2}$

6. up 3 units, left 2 units

7. reflected over the x-axis, right 2 units

8. shrink by a scale factor of $\frac{4}{5}$, right 4 units, down 8 units

9. stretch by a scale factor of 7, reflected over the x-axis, left 10 units

10. vertical compression by a scale factor of $\frac{4}{5}$, reflected over the x-axis, right 10 3 units, down 5 units