

Your Name

Mrs. Theo

2/9/2021

Notes

Lesson 2.1

Graphing and Writing

Vertex Form

Vertex Form Features to graph:

1. Graph Vertex
2. Graph reflection and dilation points using 'a'
3. Sketch curve and connect points (make obvious taller/shorter)

1. $f(x) = 1(x-2)^2 + 5$

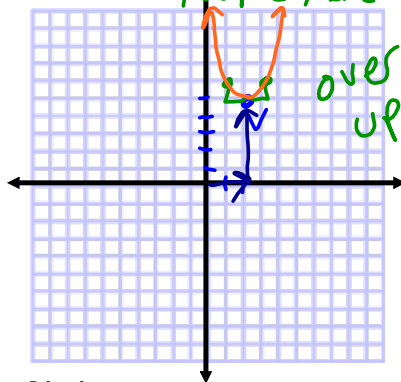
$a=1$ $h=2$ $k=5$

Vertex: $(h,k) \rightarrow (2,5)$

Translation: horizontal shift right 2

Reflection: None b/c 'a' is positive

Dilation: None, b/c 'a' = 1



2. $f(x) = 2(x+4)^2 - 7$

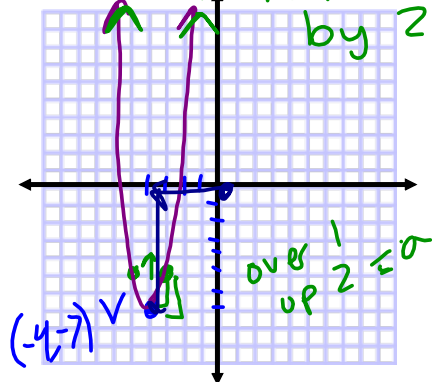
$a=2$ $h=-4$ $k=-7$

Vertex: $(-4,-7) \rightarrow (h,k)$

Translation: horizontal shift left 4 from origin

Reflection: None function points up

Dilation: Vertical stretch by 2



3. $f(x) =$

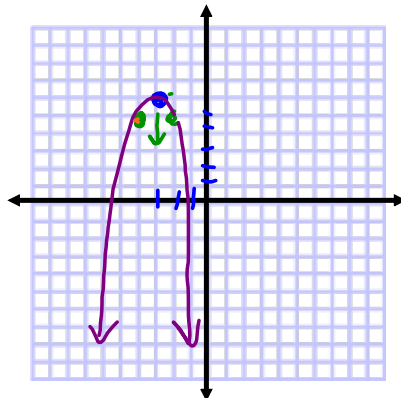
$a=$ $h=$ $k=$

Vertex:

Translation:

Reflection:

Dilation:



4. $f(x) = -2(x-4)^2 - 1$

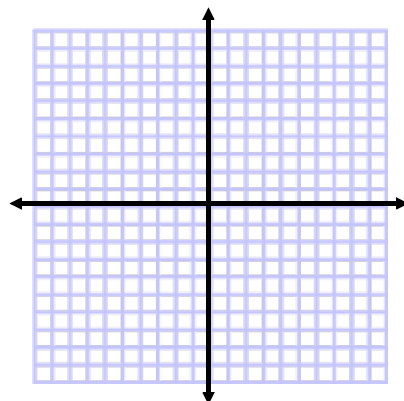
$a=$ $h=$ $k=$

Vertex:

Translation:

Reflection:

Dilation:



Vertex
Form
Features
to graph:

Homework
KEY

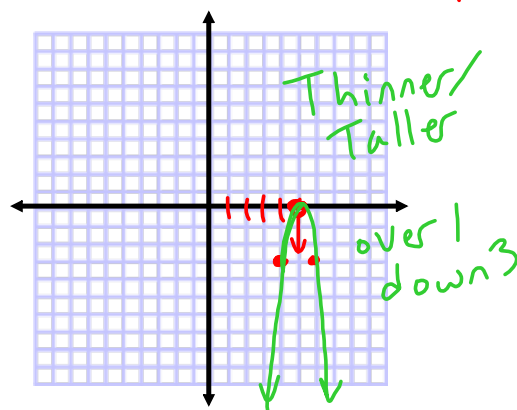
5. $f(x) = -3(x - 5)^2$

$a = -3$ $h = 5$ $k = 0$

Vertex: $(5, 0)$

Reflection: Yes

Dilation: Stretch by 3



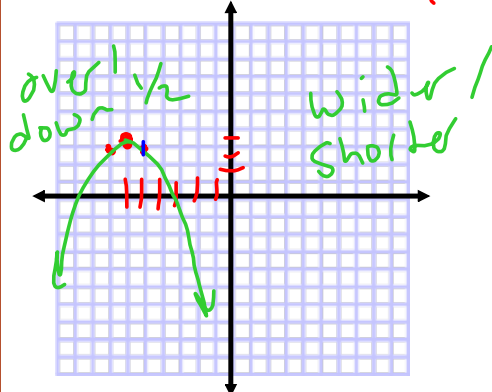
7. $f(x) = -0.5(x + 6)^2 + 3$

$a = -0.5$ $h = -6$ $k = 3$

Vertex: $(-6, 3)$

Reflection: Yes

Dilation: Shrink by $\frac{1}{2}$



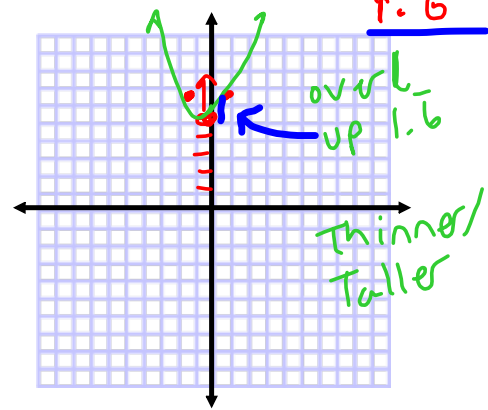
6. $f(x) = \frac{5}{3}x^2 + 5$

$a = \frac{5}{3}$ $h = 0$ $k = 5$

Vertex: $(0, 5)$

Reflection: No

Dilation: Stretch by 1.6



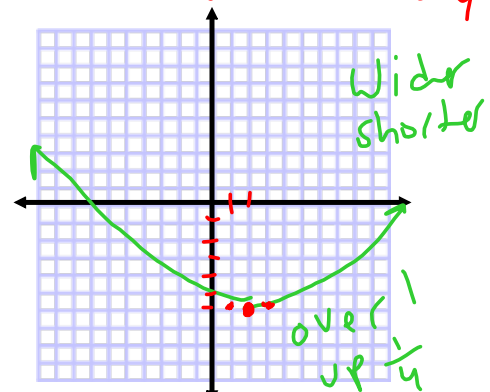
8. $f(x) = \frac{1}{4}(x - 2)^2 - 6$

$a = \frac{1}{4}$ $h = 2$ $k = -6$

Vertex: $(2, -6)$

Reflection: No

Dilation: Shrink by $\frac{1}{4}$



Algebra 2 Enriched
3.1 Vertex Form Homework

Name:
Period:

1. $f(x) = 1(x - 2)^2 + 5$

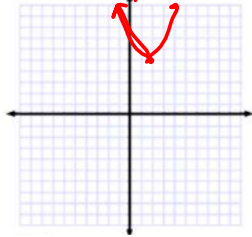
$a=1$ $h=2$ $k=5$

Vertex: $(2, 5)$

Translation: right 2
up 5

Reflection: None

Dilation: None



2. $f(x) = 2(x + 4)^2 - 7$

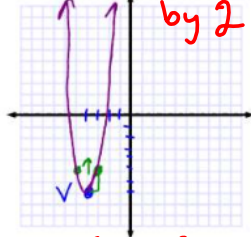
$a=2$ $h=-4$ $k=-7$

Vertex: $(-4, -7)$

Translation: left 4
down 7

Reflection: None

Dilation: stretch by 2



3. $f(x) = -(x + 3)^2 + 6$

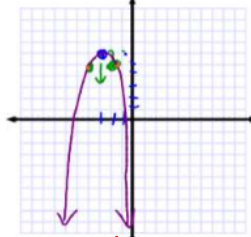
$a=-1$ $h=-3$ $k=6$

Vertex: $(-3, 6)$

Translation: left 3
up 6

Reflection: Yes

Dilation: None



4. $f(x) = -2(x - 4)^2 - 1$

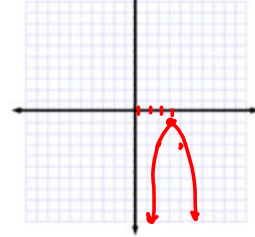
$a=-2$ $h=4$ $k=-1$

Vertex: $(4, -1)$

Translation: right 4
down 1

Reflection: Yes

Dilation: stretch by 2



5. $f(x) = 5/3x^2 + 5$

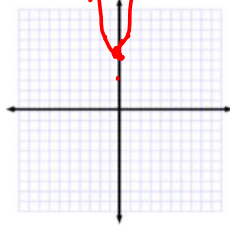
$a=5/3$ $h=0$ $k=5$

Vertex: $(0, 5)$

Translation: up 5

Reflection: None

Dilation: stretch by 5/3



6. $f(x) = -3(x - 5)^2$

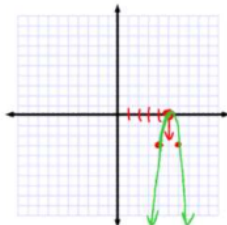
$a=-3$ $h=5$ $k=0$

Vertex: $(5, 0)$

Translation: right 5

Reflection: Yes

Dilation: stretch by 3

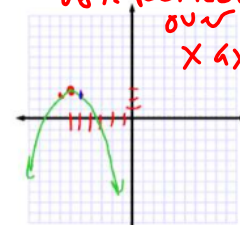


7. $f(x) = -1/2(x + 6)^2 + 3$

$a=-1/2$ $h=-6$ $k=3$

Vertex: $(-6, 3)$

Describe All Transformations:
horiz. shift left 6
vert. shift up 3
vert. compression by 1/2
vert. Reflection over x axis

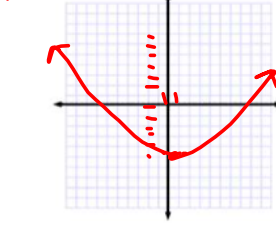


8. $f(x) = 1/4(x - 2)^2 - 6$

$a=1/4$ $h=2$ $k=-6$

Vertex: $(2, -6)$

Describe All Transformations:
horiz. shift right 2
vert. shift down 6
vert. shrink by 1/4



Determine verbal description based on the transformation equation

<p>Function 1: $y = (x - 5)^2$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input type="checkbox"/> Horizontal Reflection <input type="checkbox"/> Vertical Compression by a factor of <input type="text"/> Vertical Stretch by a factor of <input type="text"/></p> <p>Shift Up <input type="text"/> units Shift Down <input type="text"/> units Shift Left <input type="text"/> units Shift Right <input type="text"/> units</p>	<p>Function 2: $y = (x - 2)^2 + 5$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input type="checkbox"/> Horizontal Reflection <input type="checkbox"/> Vertical Compression by a factor of <input type="text"/> Vertical Stretch by a factor of <input type="text"/></p> <p>Shift Up <input type="text"/> units Shift Down <input type="text"/> units Shift Left <input type="text"/> units Shift Right <input type="text"/> units</p>
<p>Function 3: $y = -1(x + 1)^2 - 2$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input checked="" type="checkbox"/> Horizontal Reflection <input checked="" type="checkbox"/> Vertical Compression by a factor of <input type="text"/> Vertical Stretch by a factor of <input type="text"/></p> <p>Shift Up <input type="text"/> units Shift Down <input checked="" type="text"/> units Shift Left <input checked="" type="text"/> units Shift Right <input type="text"/> units</p>	<p>Function 4: $y = 2(x + 1)^2 + 3$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input checked="" type="checkbox"/> Horizontal Reflection <input checked="" type="checkbox"/> Vertical Compression by a factor of <input type="text"/> Vertical Stretch by a factor of <input checked="" type="text"/></p> <p>Shift Up <input checked="" type="text"/> units Shift Down <input type="text"/> units Shift Left <input type="text"/> units Shift Right <input type="text"/> units</p>



<p>Function 5: $y = \frac{1}{3}(x + 4)^2$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input checked="" type="checkbox"/> Horizontal Reflection <input checked="" type="checkbox"/> Vertical Compression by a factor of <u>$\frac{1}{3}$</u> Vertical Stretch by a factor of <u> </u></p> <p>Shift Up <u> </u> units Shift Down <u> </u> units Shift Left <u>4</u> units Shift Right <u> </u> units</p>	<p>Function 6: $y = -\frac{5}{3}(x - 3)^2 + 2$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input checked="" type="checkbox"/> Horizontal Reflection <input checked="" type="checkbox"/> Vertical Compression by a factor of <u> </u> Vertical Stretch by a factor of <u>$\frac{5}{3}$</u></p> <p>Shift Up <u>2</u> units Shift Down <u> </u> units Shift Left <u> </u> units Shift Right <u>3</u> units</p>
<p>Function 7: $y = -16x^2 + 2$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input checked="" type="checkbox"/> Horizontal Reflection <input checked="" type="checkbox"/> Vertical Compression by a factor of <u> </u> Vertical Stretch by a factor of <u>16</u></p> <p>Shift Up <u>2</u> units Shift Down <u> </u> units Shift Left <u> </u> units Shift Right <u> </u> units</p>	<p>Function 8: $y = 7x^2 - 4$</p> <p>Circle all that apply and complete any necessary blanks</p> <p>Vertical reflection <input checked="" type="checkbox"/> Horizontal Reflection <input checked="" type="checkbox"/> Vertical Compression by a factor of <u> </u> Vertical Stretch by a factor of <u>7</u></p> <p>Shift Up <u> </u> units Shift Down <u>4</u> units Shift Left <u> </u> units Shift Right <u> </u> units</p>

Determine function from graph

<p>Graph 1</p> <p>Function $f(x) = 2(x - 3)^2 - 4$</p>	<p>Graph 2</p> <p>Function $f(x) = 3(x + 2)^2 - 1$</p>	<p>Graph 3</p> <p>Function $f(x) = (x - 2)^2 - 5$</p>
<p>Graph 4</p> <p>Function $f(x) = -4(x - 3)^2 + 5$</p>	<p>Graph 5</p> <p>Function $f(x) = -\frac{1}{2}(x + 1)^2 + 3$</p>	<p>Graph 6</p> <p>Function $f(x) = -3(x + 2)^2 - 1$</p>

Determine function from verbal description

<p>Verbal Description 1</p> <p>Write the transformation of a quadratic function that has been vertically shifted up 4 units</p> <p>Function $f(x) = x^2 + 4$</p>	<p>Verbal Description 2</p> <p>Write the transformation of a quadratic that has shifted vertically down 5 units and left 3 units</p> <p>Function $f(x) = (x + 3)^2 - 5$</p>	<p>Verbal Description 3</p> <p>Write the transformation of a quadratic function that has shifted to the right 3 units and up 5 units</p> <p>Function $f(x) = (x - 3)^2 + 5$</p>
<p>Verbal Description 4</p> <p>Write the transformation of a quadratic function that has being reflected over the x axis, shifted up 5 units and right 2 units, and vertically compressed by a factor of $\frac{3}{7}$</p> <p>Function $f(x) = -\frac{3}{7}(x - 2)^2 + 5$</p> <p><i>Handwritten notes: a = -3/7, h = 2, k = 5</i></p>	<p>Verbal Description 5</p> <p>Write the transformation of a quadratic function that has being reflected over the x axis, vertically stretched by a factor of $\frac{5}{4}$, and shifted left 9 units</p> <p>Function $f(x) = -\frac{5}{4}(x + 9)^2$</p>	<p>Verbal Description 6</p> <p>Write the transformation of a quadratic function that has shifted to the right 6 units and down 2 units, reflected over the x axis, and vertically stretched by a factor of 2</p> <p>Function $f(x) = -2(x - 6)^2 - 2$</p>