

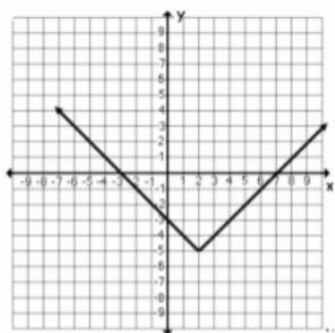
## Unit 1 Transformations of Absolute Value and Quadratic Functions WSs

Complete on a separate sheet of paper

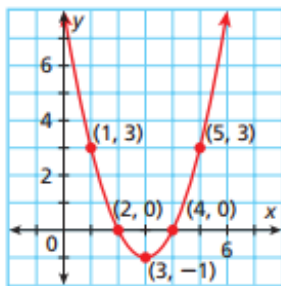
### WS 1: Horizontal and Vertical Translations

For each graph, identify the parent function, describe the transformations, write an equation for the graph, identify the vertex, describe the domain and range using interval notation, and identify the equation for the axis of symmetry.

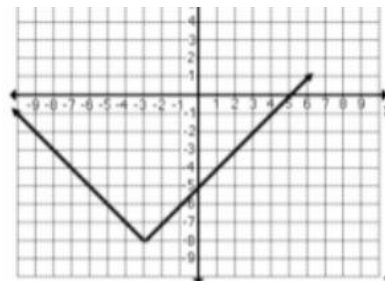
1.



2.



3.



For each equation, identify the parent function, describe the transformations, graph the function and label the vertex, and describe the domain and range using interval notation.

4.  $y = |x| + 2$

5.  $y = |x - 6|$

6.  $y = |x + 1| - 3$

7.  $y = x^2 + 3$

8.  $y = (x - 4)^2$

9.  $y = (x - 2)^2 - 1$

Given the parent graph and a list of transformations, write an equation, graph the function, and describe the domain and range using interval notation.

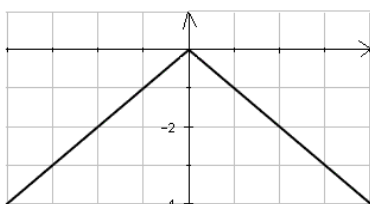
10. Quadratic function: translated 2 units up and 4 units to the right

11. Absolute Value function: translated 1 unit down and 3 units to the right

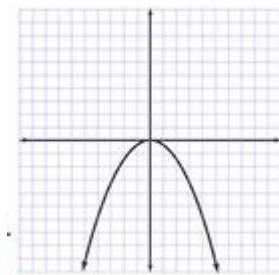
### WS 2: Reflections

For each graph, identify the parent function, describe the transformations, write an equation for the graph, identify the vertex, describe the domain and range using interval notation, and identify the equation for the axis of symmetry.

1.



2.



For each equation, identify the parent function, describe the transformations, graph the function, and describe the domain and range using interval notation.

3.  $y = -|x|$

4.  $y = -x^2$

5.  $y = (x - 1)^2 - 5$

6.  $y = |x + 4| - 2$

Given the parent graph and a list of transformations, write an equation graph the function, and describe the domain and range using interval notation.

7. Quadratic function: reflection over the x-axis

8. Absolute value function: vertical reflection

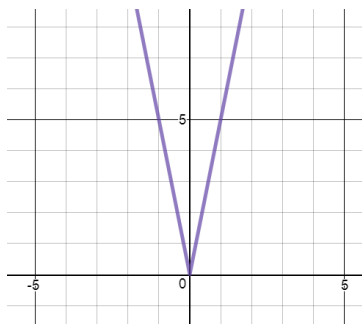
9. Quadratic function: vertical shift up two units and horizontal shift 3 units to the left

10. Absolute value function: vertical shift down 4 units and 5 units to the right

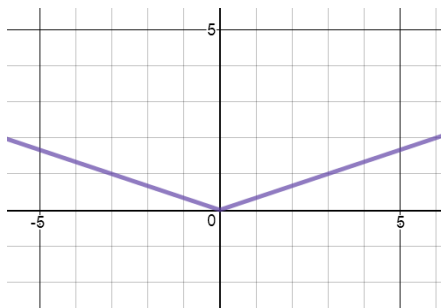
### WS 3: Stretches and Shrinks

For each graph, identify the parent function, describe the transformations, write an equation for the graph, identify the vertex, describe the domain and range using interval notation, and identify the equation for the axis of symmetry.

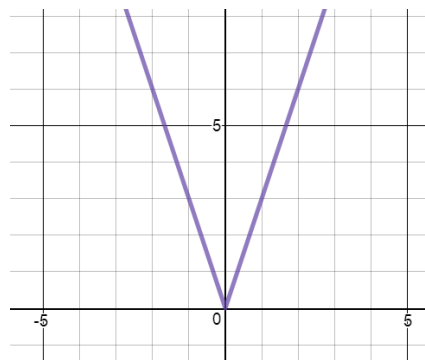
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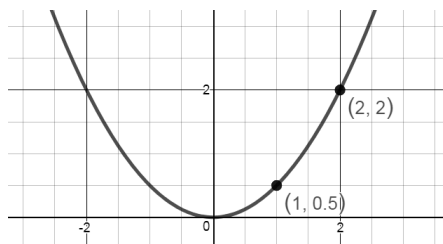
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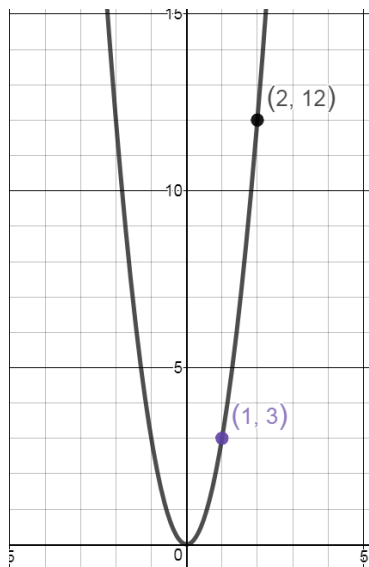
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4.



5.



For each equation, identify the parent function, describe the transformations, graph the function, and describe the domain and range using interval notation.

6.  $y = 3|x|$

7.  $y = 2x^2$

8.  $y = \frac{1}{5}|x|$

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

10.  $y = |3x|$

11.  $y = (2x)^2$

12.  $y = \left|\frac{1}{5}x\right|$

13.  $y = \left(\frac{1}{3}x\right)^2$

Given the parent graph and a list of transformations, write an equation graph the function, and describe the domain and range using interval notation.

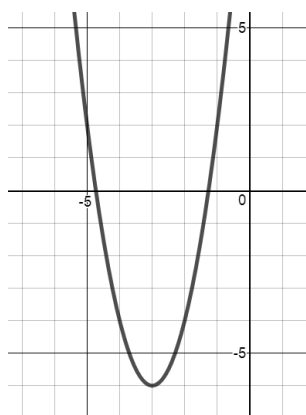
Quadratic function: vertical stretch by a factor of 4

Absolute Value Function: horizontal shrink by a factor of 3

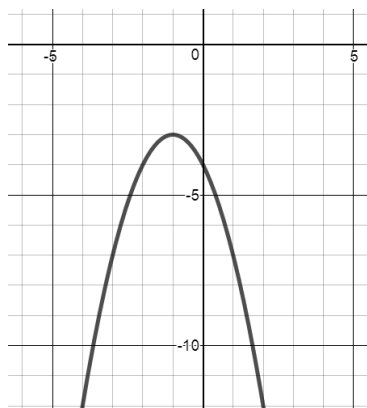
### WS 4: Combinations of Transformations

For each graph, identify the parent function, describe the transformations, write an equation for the graph, identify the vertex, describe the domain and range using interval notation, and identify the equation for the axis of symmetry.

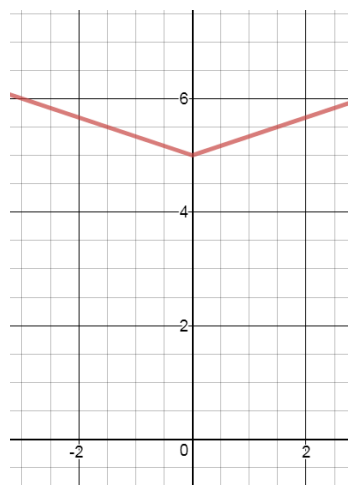
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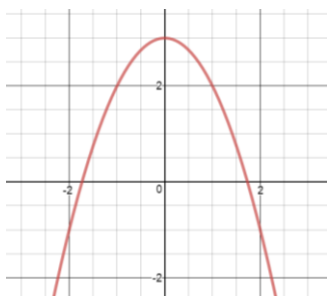
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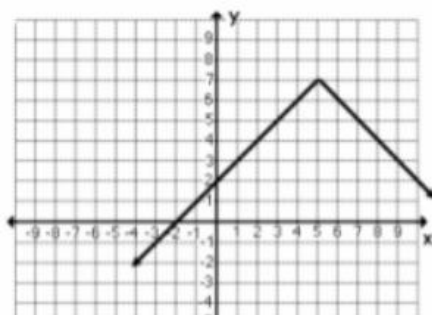
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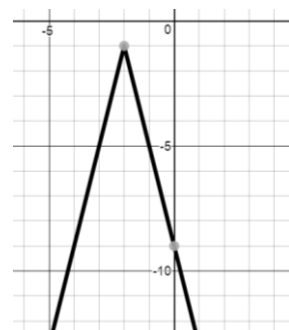
4.



5.



6.



For each equation, identify the parent function, describe the transformations, graph the function, describe the domain and range using interval notation, and identify the equation for the axis of symmetry.

7.  $y = -(x)^2 + 5$

8.  $y = 2|x + 4|$

9.  $y = (2x)^2 + 1$

10.  $y = -\left|\frac{1}{4}x\right|$

11.  $y = -(2x)^2 - 1$

12.  $y = -|3x| + 6$

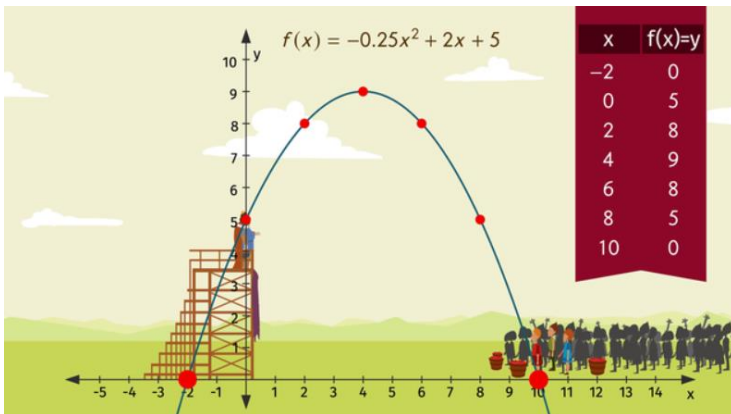
## WS 5 Characteristics of Quadratic Functions

1. The function  $h(x) = -0.03(x - 14)^2 + 6$  models the jump of a red kangaroo, where  $x$  is the horizontal distance traveled in feet and  $h(x)$  is the height in feet.

- Sketch a graph the equation (you can use a graphing calculator Desmos to help).
- Describe the domain and range and discuss what its significance in the context of the kangaroo jumping.
- Identify the maximum and discuss its significance in the context of the kangaroo jumping.
- Describe the intervals of increasing and decreasing and discuss their significance in the context of this picture.

2. For the picture below, answer the following questions:

- What is happening in this picture?
- What does the parabola represent?
- Use your knowledge of transformations to write an equation for the parabola in vertex form.
- Describe the domain and range and discuss what its significance in the context of this picture.
- Identify the vertex and discuss what its significance in the context of this picture.
- Describe the intervals of increasing and decreasing and discuss their significance in the context of this picture.
- Do you think this is a realistic graph? Why or why not?



3. Use the Flight of Cindy's Rocket to the right to answer the following:

- Identify the vertex and discuss what its significance in the context of this picture.
- Describe the intervals of increasing and decreasing and discuss their significance in the context of this picture.

