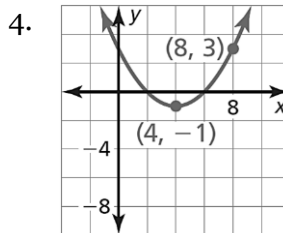
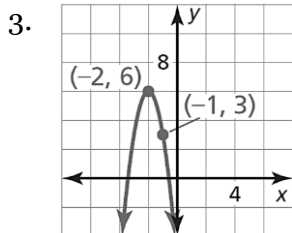


### 4.3.D4 • The Vertex of a Quadratic Function

Find the coordinates of the vertex, the range, maximum or minimum values & location, the increasing interval, and the decreasing interval for the quadratic function.

	1. $y = 2(x - 18)^2 - 3$	2. $y = -\frac{1}{2}(x + 1)^2 + 3$
VERTEX		
RANGE		
MAXIMUM/MINIMUM VALUE AND LOCATION		
INCREASING INTERVAL		
DECREASING INTERVAL		

Write the equation of the parabola (in vertex form) with the given vertex and that passes through the given point.



5. Passes through (13, 8) & has vertex (3, 2)

6. Passes through (-7, -15) & has vertex (-5, 9)

Determine the following characteristics: the direction in which the parabola opens, the equation of the axis of symmetry, the coordinates of the vertex, and the range.

7.  $q(x) = 2(x - 3)(x + 4)$       8.  $u(x) = -2(x - 2)(x - 10)$       9.  $d(x) = \frac{1}{3}(x + 5)(x - 1)$

DIRECTION OF OPENING:

DIRECTION OF OPENING:

DIRECTION OF OPENING:

AXIS OF SYMMETRY:

AXIS OF SYMMETRY:

AXIS OF SYMMETRY:

VERTEX:

VERTEX:

VERTEX:

RANGE:

RANGE:

RANGE:

Write each quadratic function in vertex form by completing the square. Then determine the direction of opening, the vertex, and the range.

10.  $y = x^2 + 12x + 23$

DIRECTION OF OPENING:

VERTEX:

RANGE:

11.  $y = 0.25x^2 - 3x + 2$

DIRECTION OF OPENING:

VERTEX:

RANGE:

12.  $y = -2x^2 + 8x + 7$

DIRECTION OF OPENING:

VERTEX:

RANGE:

13.  $y = 3x^2 + 18x - 5$

DIRECTION OF OPENING:

VERTEX:

RANGE:

14.  $y = -0.5x^2 - 2x + 12$

DIRECTION OF OPENING:

VERTEX:

RANGE:

15.  $y = 4x^2 - 12x + 15$

DIRECTION OF OPENING:

VERTEX:

RANGE: