Name: _____ Date: _____

Practise: Forms of a Quadratic Equation

Section 10.2

For the graph of a quadratic function in the *standard* form $y = a(x - h)^2 + k$, the vertex is (___ ___).

For the graph of a quadratic function in the *general* form $y = ax^2 + bx + c$, the y-intercept is ____.

1. For each function, state the vertex of its graph.

a) $y = (x - 3)^2 + 5$ **b)** $y = 2(x - 10)^2 + 45$ **c)** $y = -9(x + 1)^2 - 1$

a) vertex (3, 5)

b) vertex (10, 45)

c) (−1, −1)

2. For each function, state the y-intercept of its graph.

a) $y = x^2 - 4x + 5$ **b)** $y = 25x^2 - 16$ **c)** $y = -0.5x^2 + 2x - 2.5$

3. For each function, state the x-intercepts of its graph.

a) $y = (x + 4)(x + 7)$ **b)** $y = (x - 6)(x - 2)$ **c)** $y = 3(x + 2)(x - 11)$

4. The standard form for a quadratic equation is also known as the *vertex form*. Explain why.

5. Find the vertex, y-intercept, and x-intercepts for the function $y = 2(x - 1)^2 - 18$. Then, use these values to sketch the graph of the function.

The equation is in _____ form.

Therefore, the vertex is (___, ___).

Expand the equation to find the y-intercept:

$y = 2(x^2 - \_\_x + \_\_) - 18$

$y = 2x^2 - \_\_x + \_\_ - 18$

$y = 2x^2 - \_\_x - \_\_$

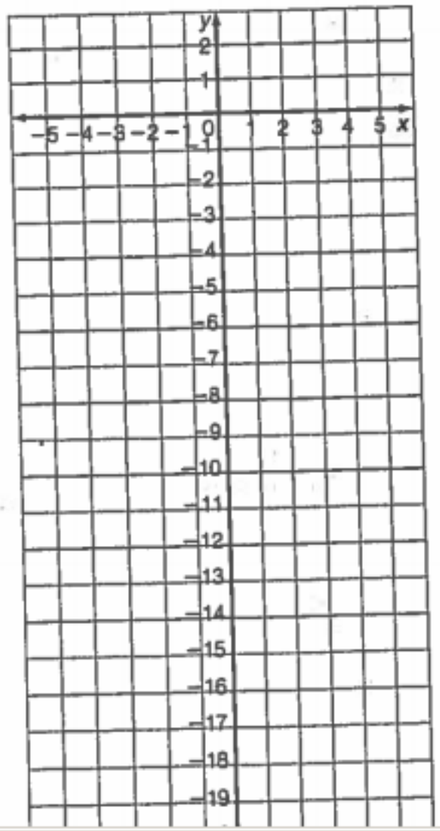
The y-intercept is _____.

Factor the general form of the equation to find the zeros:

$y = 2(x^2 - \_\_x - \_\_)$

$y = 2(x - \_\_)(x + \_\_)$

Therefore, the zeros are _____ and _____.



Name: _____

Section 10.2

6. Determine the vertex, the y-intercept, and the x-intercepts for each function.

a) $y = (x - 4)^2 - 9$

vertex: (___, ___)

Expand to general form:

$y = x^2 - \_\_x + \_\_ - 9$

$y = x^2 - \_\_x + \_\_$

The y-intercept is _____.

Now, factor the equation:

$y = (x \_\_ \_\_)(x \_\_ \_\_)$

The x-intercepts are ___ and ___.

b) $y = -2(x - 3)^2 + 50$

vertex: (___, ___)

$y = -2(x^2 \_\_ \_\_x \_\_ \_\_) + 50$

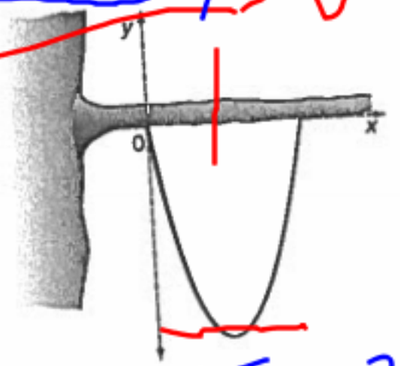
$y = a(x - h)^2 + k$

15

vertex (15, -225)

7. This rope swing hanging from a tree branch forms a parabola. With the origin at the left end of the swing, the equation for the shape of the rope is $y = (x - 15)^2 - 225$, where both x and y are measured in centimetres.

a) Give the coordinates of the vertex of the swing.



b) How far does the swing hang down from the tree branch?

225 cm

c) Rewrite the function in general form.

standard

$y = (x - 15)^2 - 225$

$y = (x - 15)(x - 15) - 225$

$y = x^2 - 15x - 15x + 225 - 225$

$y = x^2 - 30x$

d) Rewrite the function in factored form.

e) State the zeros of the function.

f) How far apart are the ends of the rope?

(15, -225)

vertex: (___, ___)

Expand to general form:

$y = x^2 - \_\_x + \_\_ - 9$

$y = x^2 - \_\_x + \_\_$

The y-intercept is _____.

Now, factor the equation:

$y = (x \_\_ \_\_)(x \_\_ \_\_)$

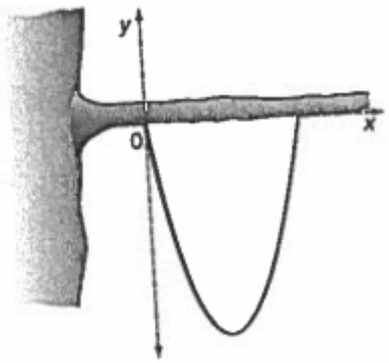
The x-intercepts are ___ and ___.

vertex: (___, ___)

$y = -2(x^2 \_\_ \_\_x \_\_ \_\_) + 50$

7. This rope swing hanging from a tree branch forms a parabola. With the origin at the left end of the swing, the equation for the shape of the rope is $y = (x - 15)^2 - 225$, where both x and y are measured in centimetres.

a) Give the coordinates of the vertex of the swing.



b) How far does the swing hang down from the tree branch?

c) Rewrite the function in general form.

$y = x^2 - 30x$

d) Rewrite the function in factored form.

e) State the zeros of the function.

f) How far apart are the ends of the rope?