

Note: It may be helpful to do your work on a separate sheet of paper!

(Key)

$y = x^2 - 4x - 5$
 $x^2 - 4x + 4 = 5 + 4$
 $(x-2)^2 = 9$
 $(2, -4)$
 $(5, 0)$
 $(-1, 0)$

Circuit Training - Quadratic Equations and Functions

Name Key

Directions: Begin in cell #1. Work the problem and then advance in the circuit by searching for the specified value. The following forms of a quadratic are used:

Form	Function
General	$y = ax^2 + bx + c$; c is the y-intercept
Vertex	$y = a(x-h)^2 + k$; (h, k) is the vertex
Factored	$y = a(x+m)(x+n)$; m, n are the x-intercepts

<p>Answer: -5</p> <p># 1 Convert the function to vertex form.</p> $y = x^2 - 12x + 30$ $x^2 - 12x + 36 = 30 + 36$ $(x-6)^2 = 66$ <p>State the vertex: $(6, 6)$</p> <p>To advance in the circuit, locate k.</p>	<p>Answer: -16</p> <p># 5 Using factored form.</p> $y = x^2 - 6x - 16$ $(x-8)(x+2)$ <p>$x = 8$ $x = -2$</p> <p>Search for the sum of the zeros.</p>
<p>Answer: -25</p> <p># 8 Transform $y = 2(x-5)^2 + 4$ to general form.</p> $2(x-5)(x-5) + 4$ $2(x^2 - 10x + 25) + 4$ $2x^2 - 20x + 54$ <p>Find the value of $b + c$.</p>	<p>Answer: 4</p> <p># 12 The vertex of a quadratic function is $(-2, -2)$. The function is vertically stretched by a factor of 2.</p> <p>Write the equation of the function and search for the sum of the zeros.</p>
<p>Answer: 12</p> <p># 14 Find the value of w if $x^2 + 10x - 8 = (x-w)^2 - 33$.</p> $x^2 + 10x + 25 = (x-w)^2 - 33$ $(x+5)^2 = (x-w)^2 - 58$ <p>$w = -5$</p>	<p>Answer: -6</p> <p># 2 Convert the quadratic function to factored form. Standard form</p> $y = (x+1)^2 - 16$ $x^2 + 2x - 15$ <p>Search for the positive zero, 3</p>

$2(x+2)^2 - 2$
 $2(x^2 + 4x + 4) - 2$
 $2x^2 + 8x + 8 - 2$
 $2x^2 + 8x + 6$
 $2(x^2 + 4x + 3)$
 $2(x+3)(x+1)$
 $x = -3$
 $x = -1$
 $Sum = -4$

$5x - 3$
 $(x+5)(x-3)$

<p>Answer: 1</p> <p># 10 A quadratic function, $g(x)$, has x-intercepts 5 and -1. In addition, $(2, -9)$ satisfies $g(x)$. Two transformations are applied to $g(x)$. First, it is reflected over the x-axis and then it is stretched vertically by a factor of 3.</p> <p>Find the y-intercept of the transformed function.</p>	<p>Answer: -12</p> <p># 7 Convert to vertex form:</p> $v(t) = 2t^2 + 12t - 4$ $2t^2 + 12t + 9 = 4 + 9$ $2(t+3)^2 - 22$ <p>Search for the sum of h and k.</p>
<p>Answer: 3</p> <p># 3 Convert the quadratic function to general form.</p> $f(x) = (x-5)^2 - 3$ $(x-5)(x-5) - 3$ $x^2 - 10x + 22$ <p>Search for the y-intercept.</p>	<p>Answer: -4</p> <p># 13 Find the vertex of $h(x) = 3(x-2)(x-6)$.</p> $3(x^2 - 8x + 12)$ $3x^2 - 24x + 36$ <p>Reflect the vertex across the x-axis. Search for the y-coordinate of the reflected vertex.</p>
<p>Answer: 15</p> <p># 11 Find the zeros of the function $y = 2x^2 - 9x + 4$.</p> $(2x-3)(x-1)$ $2x = 3 \Rightarrow x = 1.5$ $x = 1$ <p>Search for the zero that is an integer.</p>	<p>Answer: 34</p> <p># 9 In what quadrant is the vertex for the parabola whose equation is $y = -x^2 + 4x + 1$?</p> <p>II / I III / IV</p>
<p>Answer: 6</p> <p># 6 Rewrite $2x^2 + x - 6x - 3$ in general form.</p> $y = 2x^2 - 5x - 3$ $y = 2x^2 - 6x + 5$ <p>To advance in the circuit, search for ab.</p>	<p>Answer: 22</p> <p># 4 Convert the function to vertex form. State the vertex: $(1, -6)$. To advance in the circuit, search for the lesser coordinate.</p> $g(x) = (x+3)(x-5)$ $x^2 - 2x - 15$ $x^2 - 2x + 1 = 15 + 1$ <p>$(x-1)^2 = 16$</p>

Classwork

Pg #