1. Graph the parabola $y = x^2 - 2x - 8$. Compute the coordinates of at least five points on the parabola, including vertex and intercepts.

   a) Factor $x^2 - 2x - 8$ by completing the square.

   b) Use your computation above to find each of the following.

   polynomial form: $y = x^2 - 2x - 8$ $\Longrightarrow$ $y-$intercept: _____

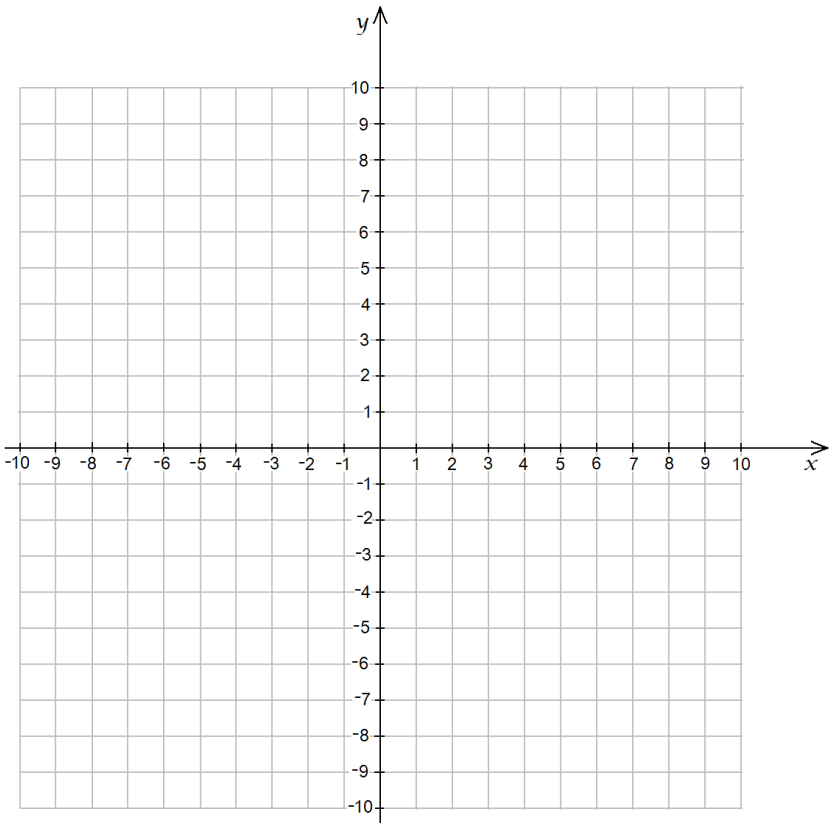
   standard form: $y =$ _____ $\Longrightarrow$ vertex: _____

   factored form: $y =$ _____ $\Longrightarrow$ $x-$intercept(s): _____

   c) Find the coordinates of a few additional points and graph the equation.

   Additional points:

x	y



2. Graph the parabola $y = x^2 + 6x + 5$. Compute the coordinates of at least five points on the parabola, including vertex and intercepts.

   a) Factor $x^2 + 6x + 5$ by completing the square.

   b) Use your computation above to find each of the following.

   polynomial form: $y = x^2 + 6x + 5$ $\Longrightarrow$ $y-$intercept: _____

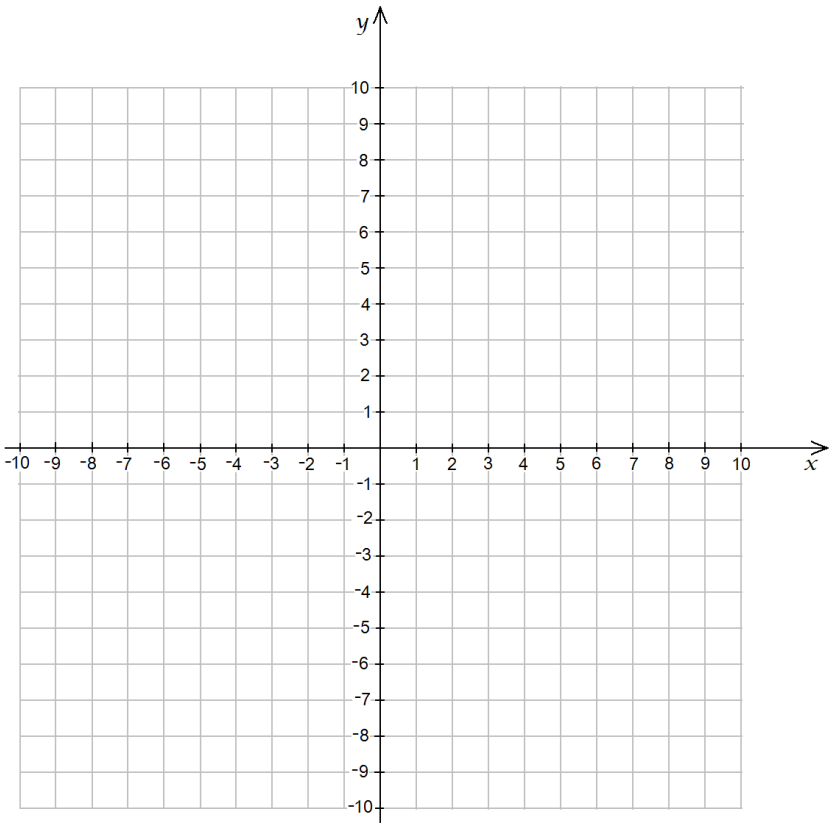
   standard form: $y =$ _____ $\Longrightarrow$ vertex: _____

   factored form: $y =$ _____ $\Longrightarrow$ $x-$intercept(s): _____

   c) Find the coordinates of a few additional points and graph the equation.

   Additional points:

x	y



3. Graph the parabola $y = x^2 - 4x + 3$. Compute the coordinates of at least five points on the parabola, including vertex and intercepts.

   a) Factor $x^2 - 4x + 3$ by completing the square.

   b) Use your computation above to find each of the following.

   polynomial form: $y = x^2 - 4x + 3$ $\Longrightarrow$ $y-$intercept: _____

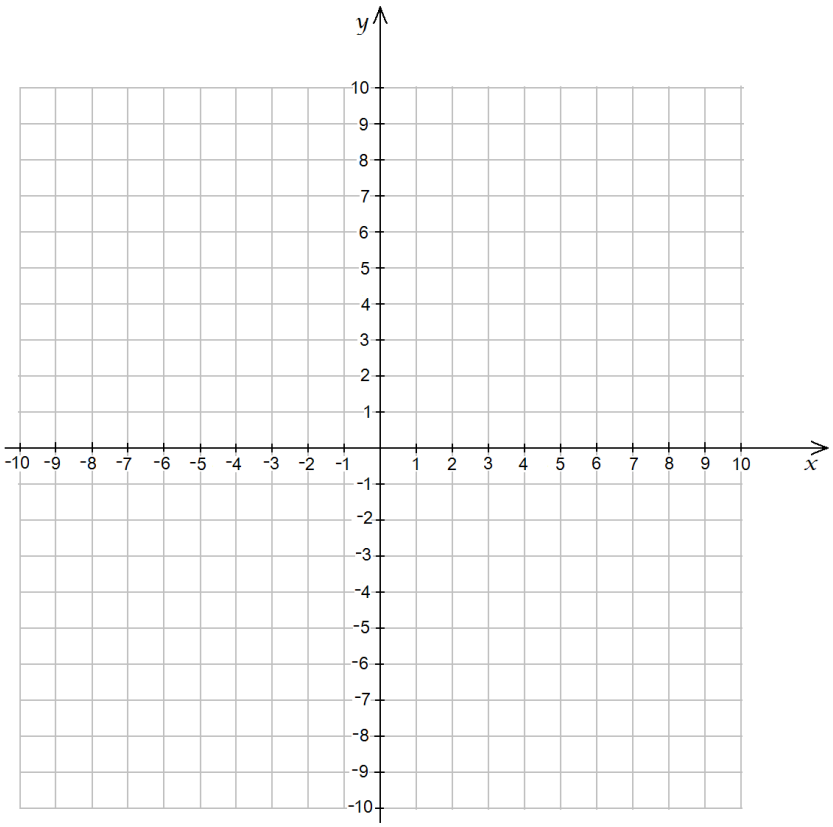
   standard form: $y =$ _____ $\Longrightarrow$ vertex: _____

   factored form: $y =$ _____ $\Longrightarrow$ $x-$intercept(s): _____

   c) Find the coordinates of a few additional points and graph the equation.

   Additional points:

x	y



4. Graph the parabola $y = x^2 + 4x - 1$. Compute the coordinates of at least five points on the parabola, including vertex and intercepts.

   a) Factor $x^2 + 4x - 1$ by completing the square.

   b) Use your computation above to find each of the following.

   polynomial form: $y = x^2 + 4x - 1$ $\Longrightarrow$ $y-$intercept: _____

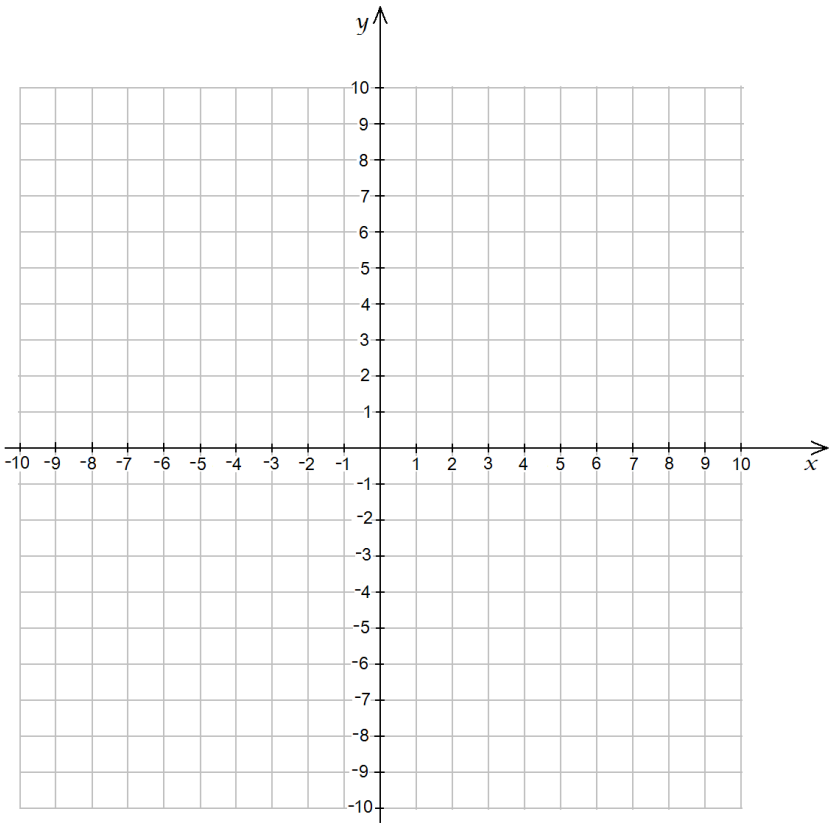
   standard form: $y =$ _____ $\Longrightarrow$ vertex: _____

   factored form: $y =$ _____ $\Longrightarrow$ $x-$intercept(s): _____

   c) Find the coordinates of a few additional points and graph the equation.

   Additional points:

x	y

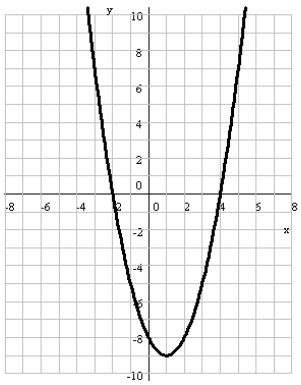


Answers

1. polynomial form: $y = x^2 - 2x - 8$ $\Rightarrow$ $y-$intercept: $(0, -8)$
   standard form: $y = (x-1)^2 - 9$ $\Rightarrow$ vertex: $(1, -9)$
   factored form: $y = (x+2)(x-4)$ $\Rightarrow$ $x-$intercepts: $(-2, 0)$ and $(4, 0)$

   additional points: $(-3, 7)$, $(-1, -5)$, $(2, -8)$, $(3, -5)$, $(5, 7)$

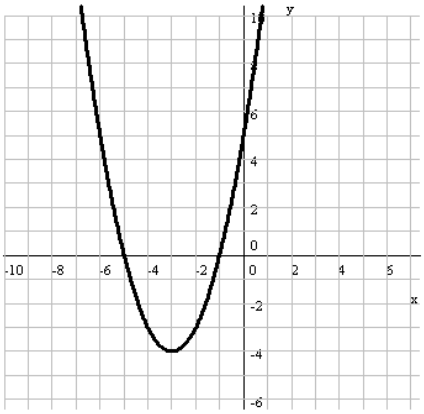
x	y
-3	7
-2	0
-1	-5
0	-8
1	-9 vertex
2	-8
3	-5
4	0



2. polynomial form: $y = x^2 + 6x + 5$ $\Rightarrow$ $y-$intercept: $(0, 5)$
   standard form: $y = (x+3)^2 - 4$ $\Rightarrow$ vertex: $(-3, -4)$
   factored form: $y = (x+5)(x+1)$ $\Rightarrow$ $x-$intercepts: $(-5, 0)$ and $(-1, 0)$

   additional points: $(-6, 5)$, $(-4, -3)$, $(-2, -3)$, $(1, 12)$

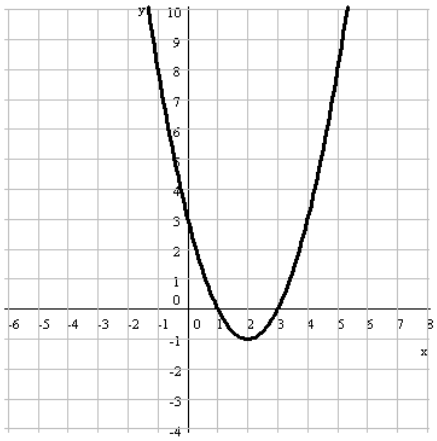
x	y
-6	5
-5	0
-4	-3
-3	-4 vertex
-2	-3
-1	0
0	5



3. polynomial form: $y = x^2 - 4x + 3$ $\Rightarrow$ $y-$intercept: $(0, 3)$
   standard form: $y = (x-2)^2 - 1$ $\Rightarrow$ vertex: $(2, -1)$
   factored form: $y = (x-1)(x-3)$ $\Rightarrow$ $x-$intercepts: $(1, 0)$ and $(3, 0)$

   additional points: $(-1, 8)$, $(4, 3)$, $(5, 8)$, $(6, 15)$

x	y
-1	8
0	3
1	0
2	-1 vertex
3	0
4	3
5	8
6	15



4. polynomial form: $y = x^2 + 4x - 1 \quad \Rightarrow$ $y-$intercept: $(0, -1)$
   standard form: $y = (x+2)^2 - 5 \quad \Rightarrow$ vertex: $(-2, -5)$
   factored form: $y = \left(x + 2 + \sqrt{5}\right)\left(x + 2 - \sqrt{5}\right)$
   $\Rightarrow$ $x-$intercepts: $\left(-2 - \sqrt{5}, 0\right)$ and $\left(-2 + \sqrt{5}, 0\right)$

additional points: $(-6, 12)$, $(-5, 4)$, $(-4, -1)$, $(-3, -4)$, $(2, 12)$,

x	y
-6	12
-5	4
-4	-1
-3	-4
-2	-5 vertex
-1	-4
-0	-1
1	4
2	12