

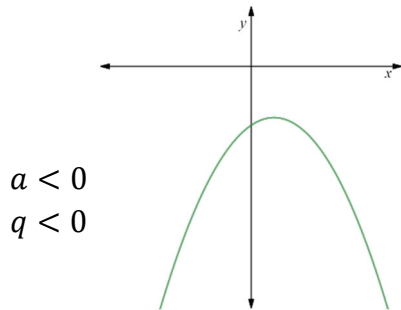
Name: _____

Date: _____

Learning Goal 4.1Given a quadratic equation, identify the number of solutions, zeros, roots or x – intercepts.

1. Determine the number of zeros of the following functions.

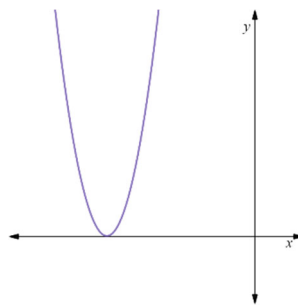
a. $y = -0.07(x - 3.1)^2 - 4.25$



Thus there are no solutions.

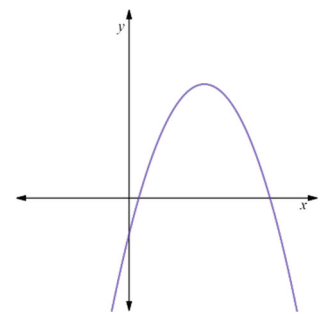
b. $y = x^2 + 18x + 81$
 $= (x + 9)^2$

Thus there is one solution.



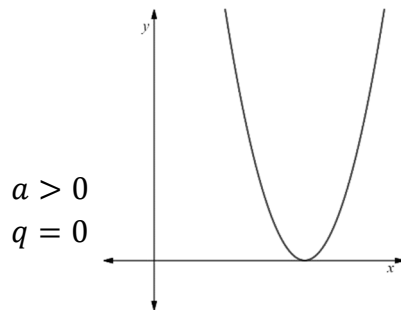
c. $y = -x^2 + 4x - 1$
 $= -(x^2 + 4x + 4 - 4) - 1$
 $= -(x^2 + 4x + 4) + 4 - 1$
 $= -(x^2 + 2)^2 + 4 - 1$
 $= -(x^2 + 2)^2 + 3$

$a < 0$
 $q > 0$



Thus there are two solutions.

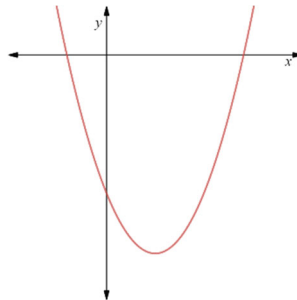
d. $y = 2(x - 3)^2$



Thus there is one solution.

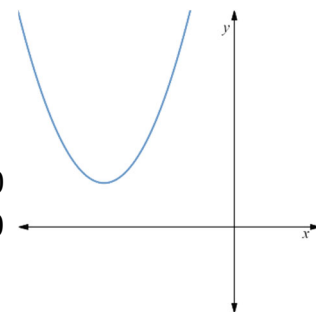
e. $y = x^2 - 5x - 14$
 $= (x - 7)(x + 2)$

Thus there are two solutions.



f. $y = x^2 + 6x + 10$
 $= (x^2 + 6x + 9 - 9) + 10$
 $= (x^2 + 6x + 9) - 9 + 10$
 $= (x + 3)^2 - 9 + 10$
 $= (x + 3)^2 + 1$

$a > 0$
 $q > 0$



Thus there are no solutions.

2. The manager at a clothing store has determined that the function $R(x) = 600 - 6x^2$ models the expected weekly revenue from sweatshirts as the price changes (R is the revenue, in dollars, and x is the price change, in dollars). What price increase or decrease will result in no revenue and explain why.

$$\begin{aligned}R(x) &= 600 - 6x^2 \\ &= 6(100 - x^2) \\ &= 6(10 - x)(10 + x)\end{aligned}$$

$$\begin{aligned}10 - x &= 0 \\ 10 &= x \\ x &= 10\end{aligned}$$

$$\begin{aligned}10 + x &= 0 \\ x &= -10\end{aligned}$$

An increase of \$10 will cause zero revenue because your product is too expensive, and no one will pay your price.

A decrease of \$10 will also cause zero revenue because you are now giving away your product for free.