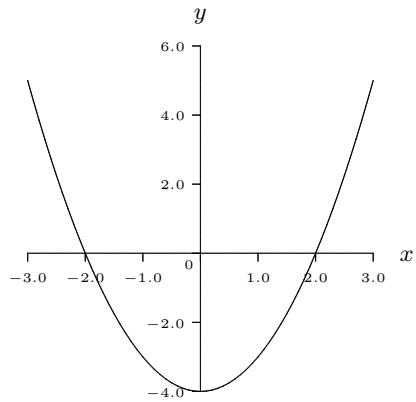
Samples **Graph of a function SOLUTIONS**

1. (a) The roots of $y = x^2 - 4$ are the x values that satisfy $x^2 - 4 = 0$. You can solve this equation either by using the quadratic formula or by factoring. Here we will use factoring.

Now because $x^2 - 4 = (x + 2)(x - 2)$, the two roots of the quadratic equation are $x = -2, 2$.

(b) The y-intercept occurs when $x = 0$, so substituting this into $y = x^2 - 4$ gives $y = -4$.

(c)

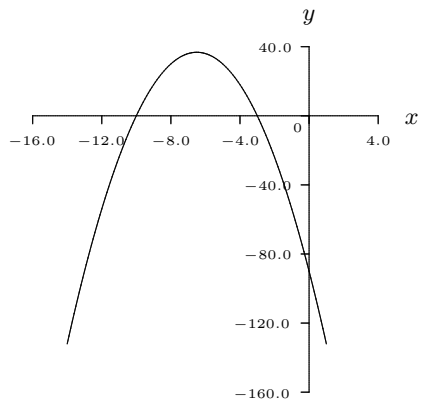


2. (a) The roots of $y = -3x^2 - 39x - 90$ are the x values that satisfy $-3x^2 - 39x - 90 = 0$. You can solve this equation either by using the quadratic formula or by factoring. Here we will use factoring.

First divide through by -3 to get $x^2 + 13x + 30 = 0$. Now because $x^2 + 13x + 30 = (x + 10)(x + 3)$, the two roots of the quadratic equation are $x = -10, -3$.

(b) The y-intercept occurs when $x = 0$, so substituting this into $y = -3x^2 - 39x - 90$ gives $y = -90$.

(c)



3. (a) The roots of $y = x^2 + 8x + 12$ are the x values that satisfy $x^2 + 8x + 12 = 0$. You can solve this equation either by using the quadratic formula or by factoring. Here we will use factoring.

Now because $x^2 + 8x + 12 = (x + 6)(x + 2)$, the two roots of the quadratic equation are $x = -6, -2$.

(b) The y-intercept occurs when $x = 0$, so substituting this into $y = x^2 + 8x + 12$ gives $y = 12$.

(c)