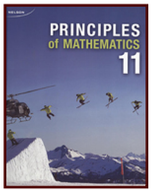
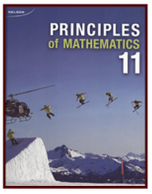


Please refer to Pages 356 and 357, Examples 1 and 2, of *Principles of Mathematics 11* for more examples of graphing quadratic functions given in vertex form.

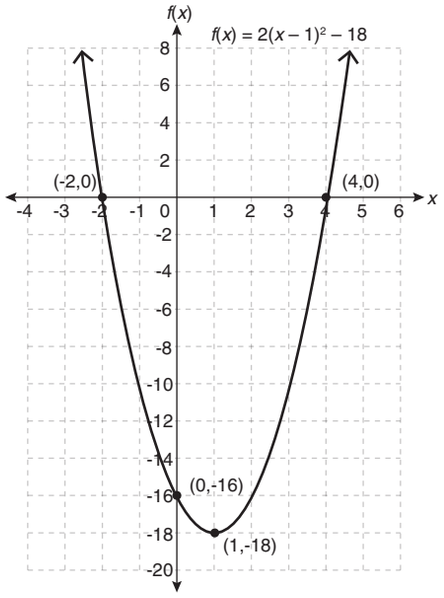
Practice Run



1. Refer to page 362 of *Principles of Mathematics 11*.

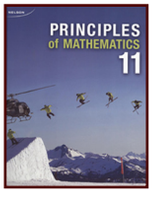
   List four important characteristics of quadratic functions written in vertex form, $y = a(x - h)^2 + k$.

2. Using the equation of the function $f(x) = 2(x-1)^2 - 18$, explain how the following information could be determined. Use the graph to verify your responses.



- the coordinates of the vertex
- the y-intercept
- the equation of the axis of symmetry
- the maximum or minimum y-value
- the domain and range

Compare your answers.

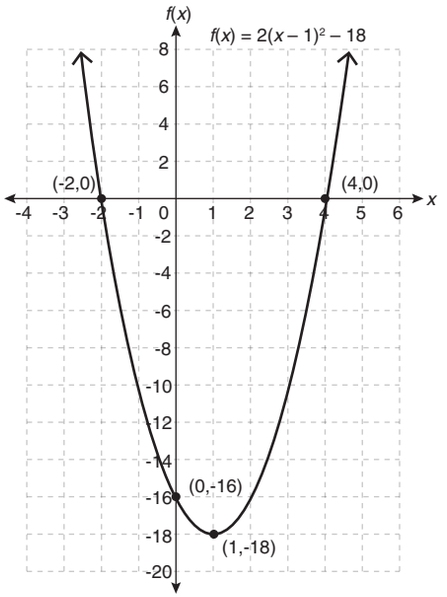


1. Refer to page 362 of *Principles of Mathematics 11*.

   List four important characteristics of quadratic functions written in vertex form, $y = a(x-h)^2 + k$.

   - (h, k) represents the vertex of the function.
   - The equation of the axis of symmetry is $x = h$.
   - When the function opens up, there is a minimum value of k.
   - When the function opens down, there is a maximum value of k.

2. Using the equation of the function $f(x) = 2(x-1)^2 - 18$, explain how the following information could be determined. Use the graph to verify your responses.



- the coordinates of the vertex

The equation is in the form $f(x) = a(x-h)^2 + k$, where (h, k) is the vertex.
The vertex is $(1, -18)$.

- the y-intercept

Let $x = 0$.

$f(x) = 2(x-1)^2 - 18$

$f(0) = 2(0-1)^2 - 18$

$f(0) = 2(-1)^2 - 18$

$f(0) = -16$

- the equation of the axis of symmetry

$x = h$

$x = 1$

- the maximum or minimum y-value

because a is positive, there is a minimum at $y = -18$

- the domain and range

Domain: $\{x \mid x \in \mathrm{R}\}$

Range: $\{y \mid y \geq -18, y \in \mathrm{R}\}$