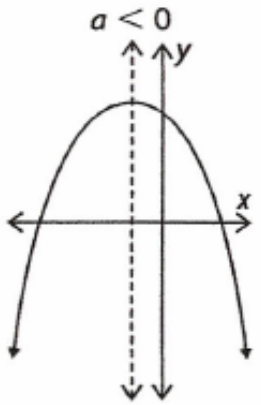
6 Test Prep

Complete the following to summarize the important ideas from this chapter.

Q: What are the characteristics of all quadratic functions and their graphs?



A:
- The degree is 2.
- The graph is a parabola with a single vertical axis of symmetry.
- The vertex of a parabola is its highest or lowest point and lies on its axis of symmetry.
- A parabola can have 0, 1, or 2 x-intercepts.

Q: What are the different forms of a quadratic function and their features?

A:
- standard form: $y=ax^2+bx+c$, where $a \neq 0$

  $a \geq 0$, parabola opens up; $a \leq 0$, parabola opens down

  c is the y-intercept.
- factored form: $y = a(x-r)(x-s)$, where $a \neq 0$

  r and s are the x-intercepts.
- vertex form: $y = a(x-h)^2+k$, where $a \neq 0$

  (h, k) is the vertex.

Q: Given the equation of a quadratic function, how can you sketch its graph?

A:
- standard form: use a table of values to determine the vertex and axis of symmetry; or use partial factoring; plot the y-intercept
- factored form: plot the x-intercepts; also determine the axis of symmetry and vertex
- vertex form: plot the vertex, determine the y-intercept, and use the axis of symmetry to determine the other symmetric point

Q: What are the characteristics of a quadratic equation?

A:
- It is a second-degree equation with one variable(s).

Q: What determines the number of roots a quadratic equation has?

A:
- The number of roots is determined by the number of times the corresponding parabola intersects the x-axis.
- There can be 0, 1, or 2 roots.

Q: One way to solve a quadratic equation is by graphing. What are some of the characteristics of a graphing solution?

A:
- Solution values are approximate. The number of solutions is obvious.
- The solution process is relatively quick.

Q: What are some of the characteristics of a factoring solution?

A:
- Solution values are exact. The number of solutions is not always obvious.
- The solution process involves solving linear equations.

Q: What is the quadratic formula?

A: • The quadratic formula is $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$.

• It applies to the quadratic equation $ax^2+bx+c=0$, where $a \neq 0$.

Q: List some of the characteristics of a solution using the quadratic formula.

A: • Solution values are exact.

• If the radicand, b^2-4ac, simplifies to a perfect square, then the equation can be solved by factoring.

• If the radicand is negative, then the equation has no real solution.

Q: Why is the context of a problem important for the number of solutions?

A: • A problem may have only one admissible solution, even though the quadratic equation that represents it has two real solutions. Solutions that do not make sense for the problem are inadmissible.