

4.4 Solving Quadratic Equations by Square Root Property

Steps:

1. Isolate the squared variable expression
2. Use the square root property to undo the square. Use \pm on the side opposite the variable. If the radicand is negative, then the equation has no real solutions.
3. Rewrite as two equations and solve.

Solve the following:

a. $3 = 5(x + 3)^2 - 17$ b. $-3x^2 + 12 = -15$

c. $(p - 5)^2 + 20 = 4$

4.5 Solving Equations by Factoring

Steps:

1. Set the polynomial equal to zero
2. Factor the polynomial completely
3. Set each factor equal to zero and solve
4. Check your answers

Solve the following by factoring:

a. $x^2 + 3x - 50 = 38$

Solve the following by factoring.

b. $3x^2 - 5x = 28$

c. $10x^3 + 66x^2 - 28x = 0$

4.6 Solving Quadratic Equations by Quadratic Formula

Steps:

1. Set the standard form of a quadratic equation equal to zero ($ax^2 + bx + c = 0$)
2. Substitute the values for a , b , and c into the quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
3. Simplify the quadratic formula.
4. Check answers in the original equation.

Solve the following quadratic equations. Round your answers to three decimal places.

a. $4x^2 + 3x - 10 = 0$

b. $-2h^2 - 7h = -9$

Solve the following quadratic equations. Round your answers to three decimal places.

c. $2.6x^2 - 3.8x - 4.2 = 0$

Solve the following equations using any method.

a. $4x^3 + 5x^2 - 6x = 0$

b. $6p^2 + 15 = 21$

Solve the following equations using any method.

c. $k^2 + 6k = -5$

d. $1.3x^2 + 4.1x - 7.2 = 0$

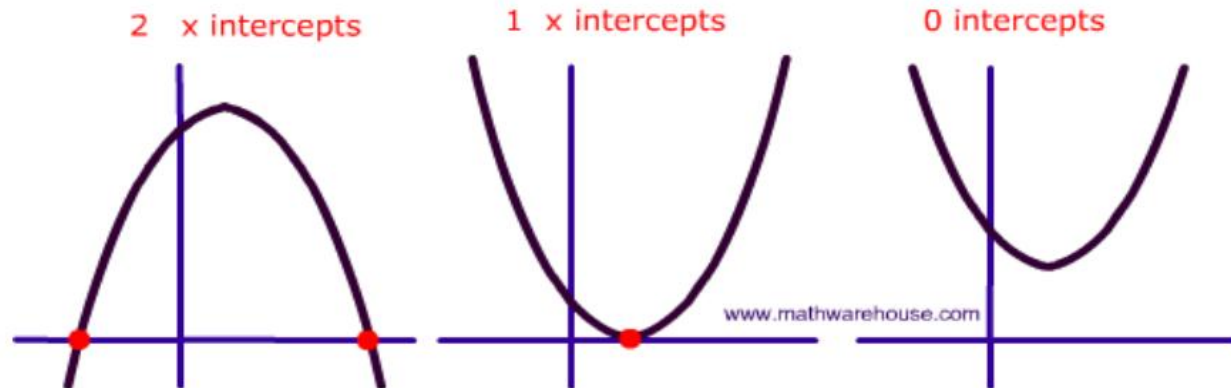
4.7 Revisited

We can now find all the components necessary to make a thorough graph of a parabola:

- Determine which way the parabola faces (*a value*)
- The vertex
 - (h,k) from vertex form
 - vertex formula $x = \frac{-b}{2a}$, solve for y from standard form
- The axis of symmetry
- The y-intercept ($x=0$, *solve for y*)

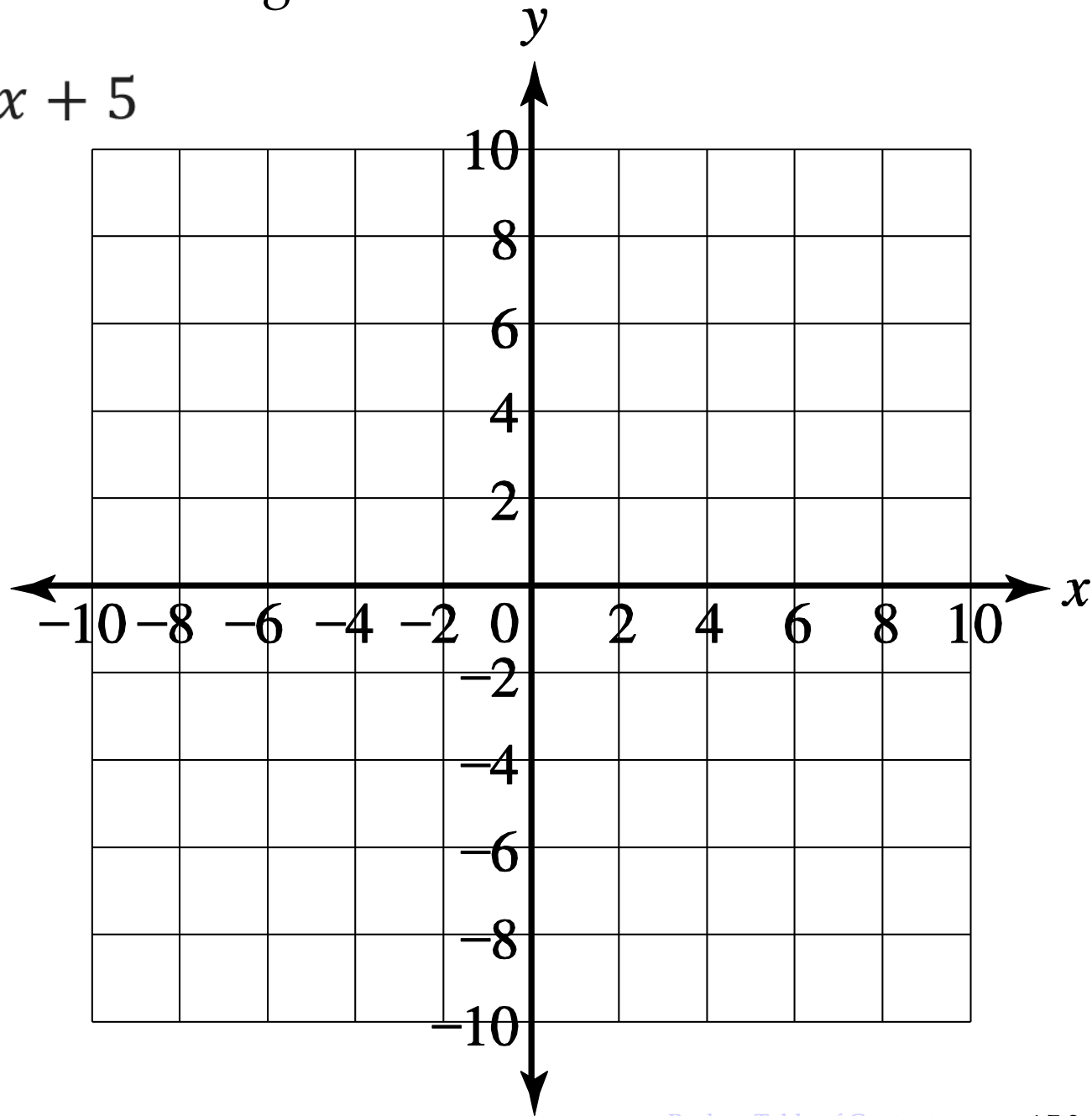
- The x-intercepts (*set $y = 0$ and solve for x*)
 - Calculate the ZEROS using the graphing calculator
 - Use the square root property if you can isolate the squared variable expression
 - Factor the polynomial if possible and set each factor equal to zero
 - Use the quadratic formula if the equation is written in standard form

A parabola can have two, one, or no x-intercepts



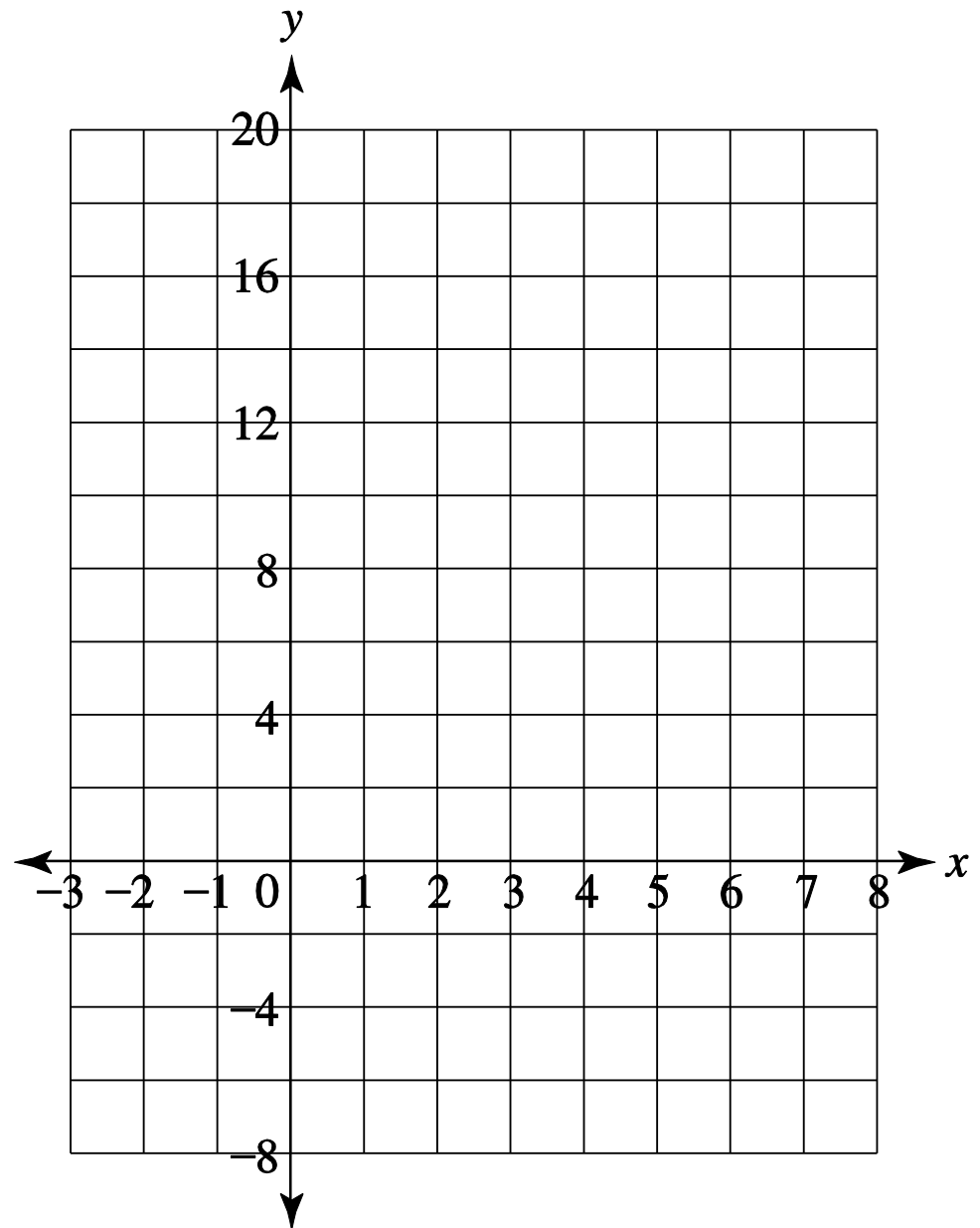
Sketch the graph of the following:

a. $f(x) = -x^2 + 4x + 5$



Sketch the graph of the following:

b. $f(x) = 1.5x^2 - 9x + 7.5$



Sketch the graph of the following:

c. $f(x) = -0.25x^2 - 3x - 15$

