

Analyze Quadratic Functions using Graphing Calculator

Steps

- 1) Press Y =. Enter the equation.
- 2) Press GRAPH.
- 3) Check your zoom. Press ZOOM. 6:STANDRAD should work, or ZOOM 9:FIT.

To find vertex (and AOS):

- 4) Press 2nd TRACE (CALC)
- 5) Based on your graph decide if the vertex is a maximum or minimum.
 - a. maximum → parabola is an arch; minimum → parabola is a u-shape
 - b. Press 3:MINIMUM or 4:MAXIMUM
- 6) Tell your calculator what is the Left & Right Bound.
 - a. Arrow over to the left side of the vertex, press Enter. (Left Bound)
 - b. Arrow over to the right side of the vertex, press Enter. (Right Bound)
 - c. Guess? Press Enter.
 - d. Write the vertex as an ordered pair, (x, y) .
- 7) The equation of the Axis of Symmetry is $x =$ the x-coordinate of the vertex.

To find the x-intercepts:

- 8) Press 2nd TRACE (CALC).
- 9) Press 2:ZERO.
- 10) Tell your calculator what is the Left & Right Bound.
 - a. Arrow over to the left side of one x-intercept, press Enter. (Left Bound)
 - b. Arrow over to the right side of the same x-intercept, press Enter. (Right Bound)
 - c. Guess? Press Enter.
 - d. Write the x-intercept as an ordered pair, $(x, 0)$.
 - e. Repeat this process for the other x-intercept (if it exists).

To find the y-intercept:

- 11) Press 2nd TRACE (CALC).
- 12) Press 1:VALUE.
- 13) Enter in X = 0 because y-intercepts always have $x = 0$.
- 14) Write the y-intercept as an ordered pair, $(0, y)$.

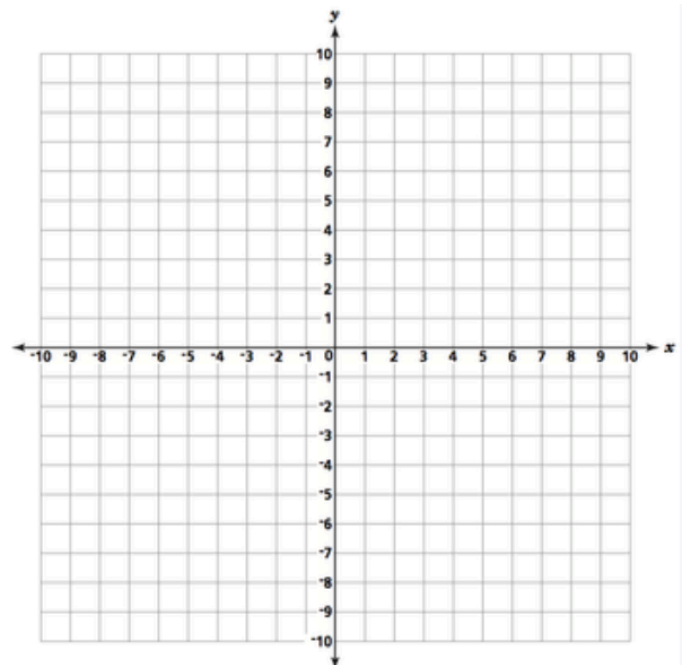
Ex. 1 $f(x) = -3x^2 + 14x - 8$

Vertex:

AOS:

x-intercepts:

y-intercept:



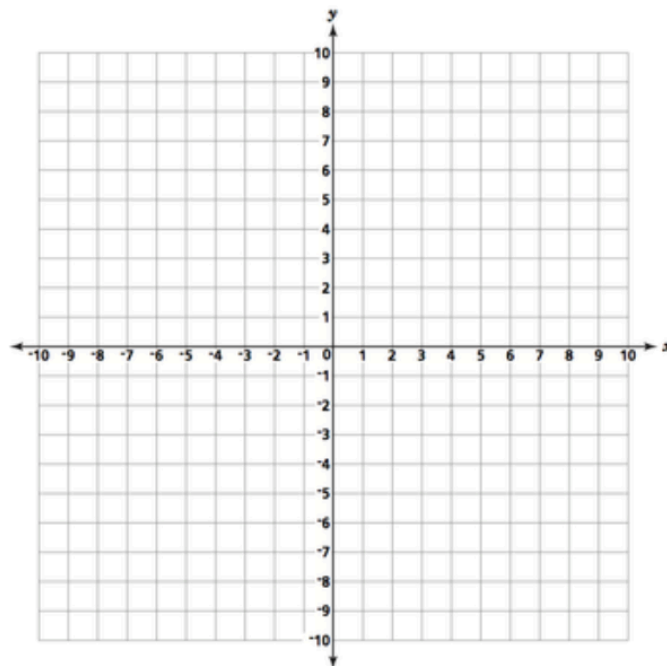
You Try 2 $y = 2x^2 - 4x - 2$

Vertex:

AOS:

x-intercepts:

y-intercept:



Ex. 3

Suppose you are tossing an apple up to a friend on a third-story balcony. After t seconds, the height of the apple in feet is given by $h = -16t^2 + 38.4t + 0.96$.

- a. Your friend catches the apple just as it reaches its highest point. How long does the apple take to reach your friend, and at what height above the ground does your friend catch it?

- b. Let's say your friend misses the catch, and the apple continues its trajectory to fall to the ground. How long was the flight of the apple?

You Try 4

A lighting fixture manufacturer has daily production costs of $C = 0.25n^2 - 10n + 800$, where C is the total daily cost in dollars and n is the number of light fixtures produced. How many fixtures should be produced to yield a minimum cost? What is that minimum cost?