

"Teacher"

Name

15/6 Date 4/16/18

Section 2Q9

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 0: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 \rightarrow parabola is an arch; minimum \rightarrow 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, $(0, y)$.

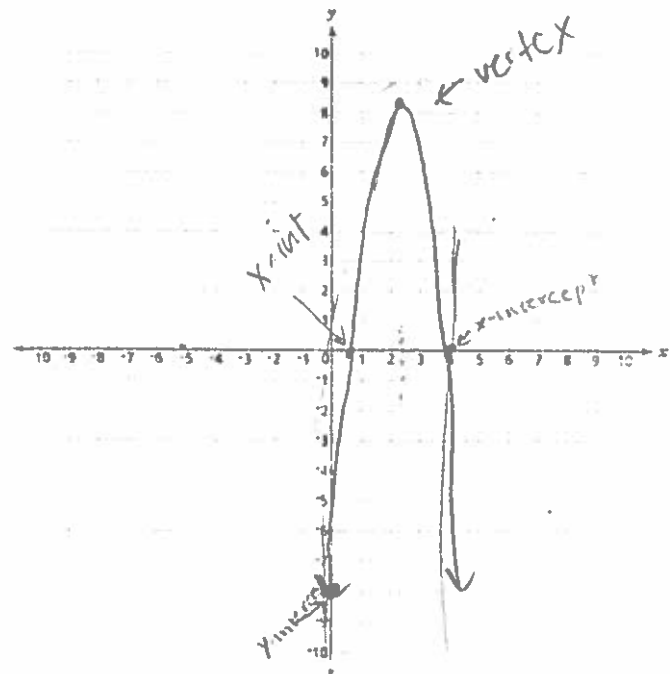
Ex. 1 $f(x) = -3x^2 + 14x - 8$ Maximum

Vertex: $(2.\bar{3}, 8.\bar{3})$

AOS: $x = 2.\bar{3}$

x-intercepts: $(4, 0)$ & $(-\frac{2}{3}, 0)$

y-intercept: $(0, -8)$





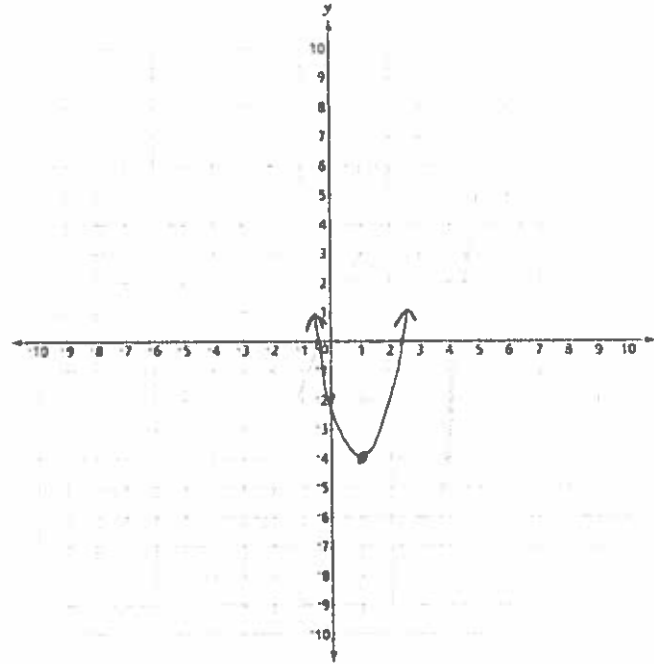
You Try 2 $y = 2x^2 - 4x - 2$ Minimum

Vertex: $(\bar{x}, -4) \rightarrow (1, -4)$

AOS: $x = \bar{x} \rightarrow x = 1$

x-intercepts: $(-0.414, 0) + (2.414, 0)$

y-intercept: $(0, -2)$



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 ^{Maximum} highest point. How long does the apple take to reach your friend, and at what height above the ground does your friend catch it?

Vertex: $(1.19, 24)$

AOS: $x = 1.19$

x-intercept:

y-intercept:

After 1.19 seconds, friend catches the apple at 24 feet

- * 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?

$$h = \frac{-(-10)}{2(0.25)} = \frac{10}{0.5} = 20$$

$$K = 0.25(20)^2 - 10(20) + 800 = 700$$

20 light fixtures produces \$700
minimum cost