

Find zeros using any method. Simplify in simplest radical form.

1.) $0 = 3x^2 - 4x - 1$
 $X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $X = \frac{4 \pm \sqrt{(-4)^2 - 4(3)(-1)}}{2(3)}$
 $X = \frac{4 \pm \sqrt{28}}{6}$
 $X = \frac{4 \pm 2\sqrt{7}}{6}$

2.) $0 = -x^2 - 5x + 6$
 $0 = x^2 + 5x - 6$
 $(x-1)(x+6) = 0$
 $x-1=0 \quad x+6=0$
 $x=1 \quad x=-6$

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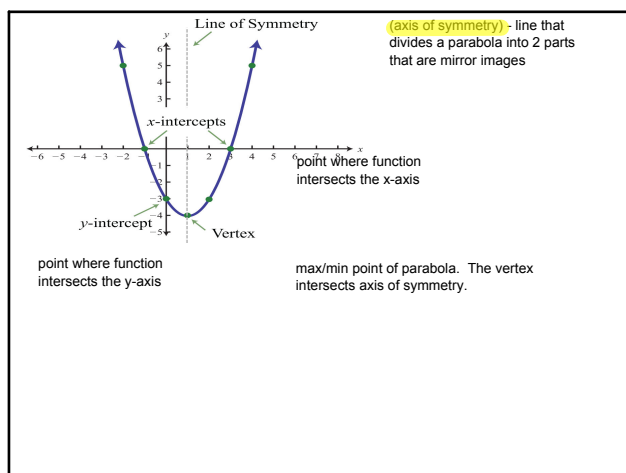
Introduction to Quadratics

Form: $f(x) = ax^2 + bx + c$

Quadratic Term Linear Term Constant Term

The graph of a quadratic function is a curve called a parabola.

Sep 18-2:54 PM



Sep 18-2:58 PM

Properties of Quadratics

1. When written in standard form, the value of a determines the direction a parabola opens.

a. When $a > 0$, the parabola opens up and has a minimum value.

b. When $a < 0$, the parabola opens down and has a maximum value.

2. The vertex is the highest or lowest point on a parabola.

Sep 18-3:01 PM

How to Graph a Quadratic by Hand:

Step 1	Find the axis of symmetry.
Step 2	Find the vertex.
Step 3	Find the y-intercept.
Step 4	Find more points as needed. (Make a table)

Sep 18-3:17 PM

Formulas to know when using standard form $ax^2 + bx + c$

1. Axis of Symmetry: $x = \frac{-b}{2a}$

2. Vertex: $(\frac{-b}{2a}, f(\frac{-b}{2a}))$
 Substitute x value and solve for y

3. y-intercept: $(0, c)$
 From original equation
 $y = ax^2 + bx + c$

Sep 18-3:05 PM

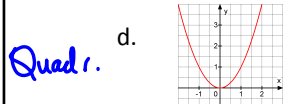
Questions to think about:

1. Is it quadratic or linear?

Quadr. a. $y = (2x + 3)(x - 4) = 2x^2 - 5x - 12$

Lin b. $f(x) = 3(x^2 - 2x) - 3(x^2 - 2) = -6x + 6$

Lin c. $f(x) = (x^2 + 5x) - x^2 = 5x$



Look at the graph and answer:

- 2.
- What is the vertex?
 $(2, 1)$
 - Is it a maximum or minimum?
Max pt.
 - What is the maximum value of the function?
max value: 1
 - What is the domain and range for the function?
D: All Reals $(-\infty, \infty)$
R: $y \leq 1$ $(-\infty, 1]$

Sep 18-3:10 PM

Sep 18-3:14 PM

Ex1) Graph $y = 5x^2 - 10x - 4$

A. AOS:

$$x = -\frac{b}{2a} = \frac{10}{2(5)} = \frac{10}{10} = 1$$

B. V:

$$V(1, -9)$$

C. y-int:

$$(0, -4)$$

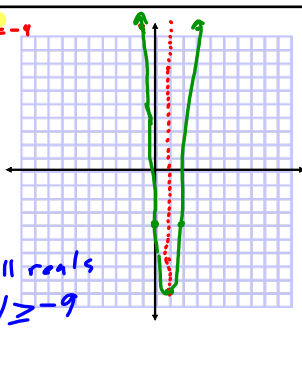
D. table:

x	y
-1	1
0	-4
1	-9
2	-4
3	1

E. domain/range:

$$D = (-\infty, \infty)$$

$$R = [-9, \infty)$$



Check with your calculator!

Sep 18-3:27 PM

Ex2) Graph $y = -2x^2 + 4$ $a = -2$ $b = 0$ $c = 4$

A. AOS:

$$x = -\frac{b}{2a} = \frac{0}{2(-2)} = 0$$

B. V:

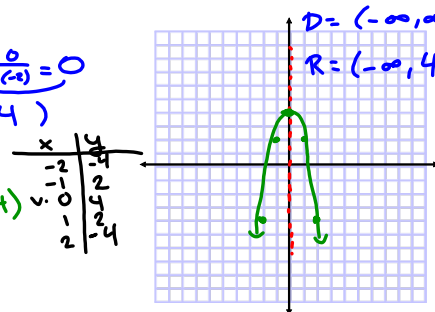
$$V(0, 4)$$

C. y-int:

$$(0, 4)$$

D. Table:

E. domain/range:



Sep 18-3:29 PM

Finding minimum and maximum values using calculator.

1. $y = 3x^2 + 12x + 8$

Vertex $(-2, -4)$

min value: -4

2. $y = -3x^2 + 10x - 5$



Pract 5-2

① a.o.s. $x = -\frac{b}{2a}$

② v: (,)

③ x | y

v:

④ Graph it!

Try Now to Solve Homework Problems.

Sep 18-3:30 PM

Oct 1-9:01 AM