1. Find the EXACT solutions to each equation using square roots.

a. $2x^2 + 8 = 56$

$-8 \quad -8$

$\frac{2x^2}{2} = \frac{48}{2}$

$\sqrt{x^2} = \sqrt{24}$

$x = \pm 2\sqrt{6}$

$\sqrt{24} < 6$

$\sqrt{24} < 4$

b. $(x-3)^2 - 5 = 76$

$+5 \quad +5$

$\sqrt{(x-3)^2} = \sqrt{81}$

$x - 3 = \pm 9$

$x - 3 = 9 \qquad x - 3 = -9$

$x = 12 \qquad x = -6$

2. Factor each completely.

a) $3x^3 - 9x^2 - 84x$

$3x(x^2 - 3x - 28)$

$3x(x+4)(x-7)$

$-28$

$+4 \quad -7$

$-3$

| | $x$ | $+4$ |
|---|---|---|
| $x$ | $x^2$ | $+4x$ |
| $-7$ | $-7x$ | $-28$ |

b) $8x^2 + 2x - 15$

$-120$

$12 \quad -10$

$2$

| | $2x$ | $+3$ |
|---|---|---|
| $4x$ | $8x^2$ | $12x$ |
| $-5$ | $-10x$ | $-15$ |

$(2x+3)(4x-5)$

Quiz Review

1. Without using a graphing calculator put the following quadratic functions in order from Widest to Narrowest:

Widest

E. $y = 0.15x^2 - 6x + 34$

B. $y = -0.8x^2 + 16x + 11$

A. $y = -3x^2 + 2x - 1$

C. $y = 5x^2 - 9x$

D. $y = -7x^2 - 8x - 26$

Narrowest

2. The vertex of a parabola is (6, -1). Write the equation of the Line of Symmetry.

$x = 6$

3. The LOS of the quadratic $y = 2x^2 - 12x + 5$ is $x = 3$. Write the coordinates of the vertex.

$(3, -13)$

4. State if the vertex of each parabola Opens Up/Down & if it has a Min/Max.

a) $y = -9x^2 + 4x + 15$

D/max

b) $y = 0.65x^2 - 18x + 3$

U/min

c) $y = 20x^2 - 94x - 113$

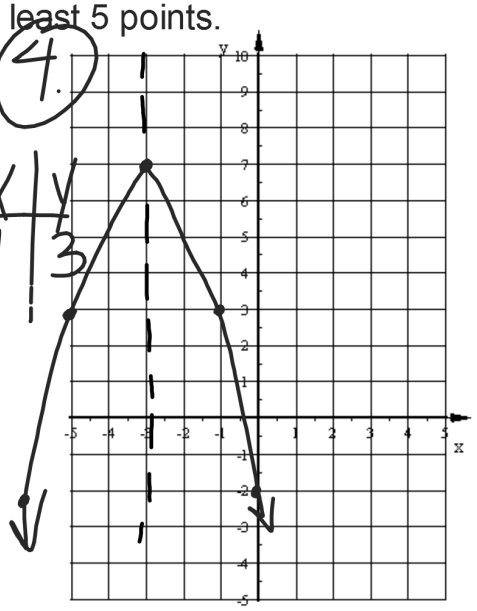
U/min

Graphing Quadratics: Use at least 5 points. Include the vertex and two points on each side.

Graph: $y = -x^2 - 6x - 2$

1. $X = -3$
2. $(-3, 7)$
3. $y = -2$
4. 
5. 

| X | Y |
|---|---|
| −1 | 3 |

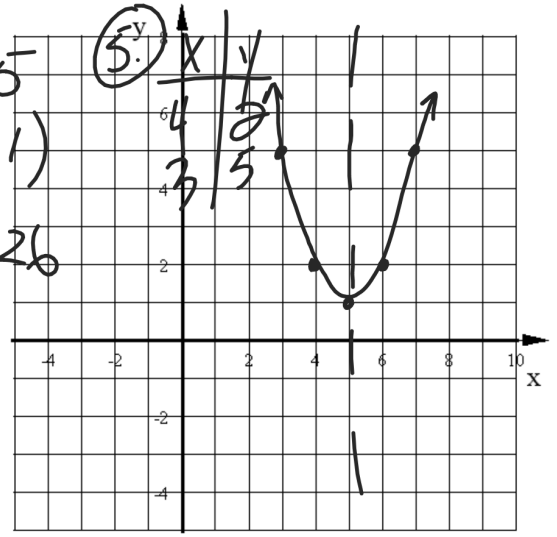


$y = x^2 - 10x + 26$

| X | Y |
|---|---|
| −2 | |
| −1 | |
| 0 | |
| 1 | |
| 2 | |

1. $X = 5$
2. $(5, 1)$
3. $y = 26$
4. 
5. 

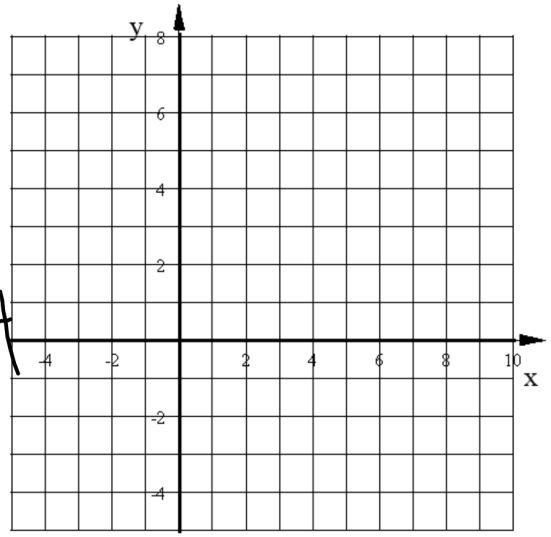
| X | Y |
|---|---|
| 4 | 2 |
| 3 | 5 |



$y = x^2 - 10x + 26$

How would it help if you know the LOS was $x = 5$?

vertex more reflect



Finding the Line of Symmetry:

$y = ax^2 + bx + c$

LOS: $x = \frac{-b}{2a}$

"opposite of $b$ divided by $2a$"

Find the equation for the LOS in each Quadratic

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

2. $y = x^2 - 8x + 3$ $x = 4$

3. $y = -2x^2 + 20x + 33$ $x = 5$

Once you've found the LOS what part of the parabola can you now find?

VERTEX $x = 4$

$y = 2x^2 - 16x + 7$

Find the equation for the LOS and the coordinates of the vertex. $(4, -25)$

Find the LOS: $y = 2x^2 + 16$ $x = 0$

When there is no b term the LOS is always: x = 0

To find the y-intercept of any function you simply replace x with zero and find y.

Find the y-intercept of each quadratic.

1. $y = 3x^2 - 6x + 10$ $y = 10$

2. $y = -5x^2 + x - 7$ $y = -7$

3. $y = 8.3x^2 + 13x$ $y = 0$

When a quadratic is in Standard Form: $y = ax^2 + bx + c$

the y-intercept is always the constant ( c).

Do the following for this quadratic:
$y = -4x^2 - 24x + 19$

a. Write the eq for the LOS. $x = -3$

b. Write the coordinates of the Vertex. $(-3, 55)$

c. Find the y-intercept. $y = 19$

d. Is the vertex a Max or a Min? max

Solving Quadratic Equations:

A Quadratic Equation has the following form:

$ax^2 + bx + c = 0$ This means y = 0

When y=0 the corresponding value of x is the x-intercept of the graph.

Solutions to this equation are:

- zeros of the function
- x-intercepts of the graph

Ways to find x-intercepts of a quadratic function (solving the equation when y=0):

- Factoring
- Graphing
- Square Roots
- Quadratic Formula

Find the x-intercepts of this quadratic function:

$y = x^2 - 13x + 30$

$0 = x^2 - 13x + 30$

$(x - 3)(x - 10) = 0$

$x = 3, +10$

30

$-3 \quad -10$

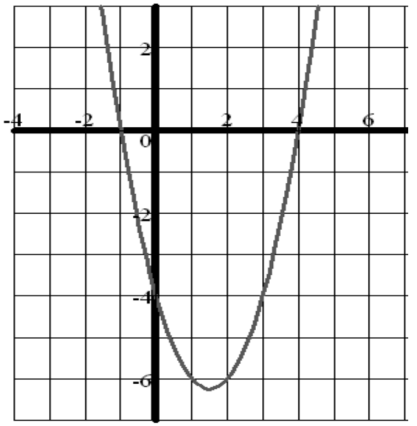
$-13$

Use the graph below to solve this equation:

$x^2 - 3x - 4 = 0$

$x = 4, -1$

they are the x-intercepts of the graph.



Now factor the quadratic:

$(x - 4)(x + 1)$

What are the zeros of the factors?

Solve by factoring:

$2x^2 - x - 28 = 0$

$-8$

$-8 \quad 7$

$-1$

$7$

| | $x$ | $-4$ |
|---|---|---|
| $2x$ | $2x^2$ | $-8x$ |
| $+7$ | $7x$ | $-28$ |

$(x - 4)(2x + 7) = 0$

$x = 4, \frac{-7}{2}$

Solve using Square Roots.

$(x + 3)^2 + 8 = 33$

$-8 \quad -8$

$(x+3)^2 = 25$

$x + 3 = 5 \qquad x + 3 = -5$

$x = 2 \qquad x = -8$

IXL #15 - BB.5 & BB.6 due Friday at 4pm!