Learning Objectives 3/13/18

- I can solve and graph quadratic inequalities.

Opening: 3/13/18

How are equations different from inequalities?

Guided Practice: Graphing Quadratic Inequalities 3/13/18

1. Find the vertex: $\left(\frac{p+r}{2}, f\left(\frac{p+r}{2}\right)\right)$ or $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$
2. Factor the quadratic, solve for roots
3. Graph the function
4. Choose a test point (0,0) if not on graph
    i. Evaluate test point
    ii. If TRUE shade point section
    iii. If FALSE shade other section

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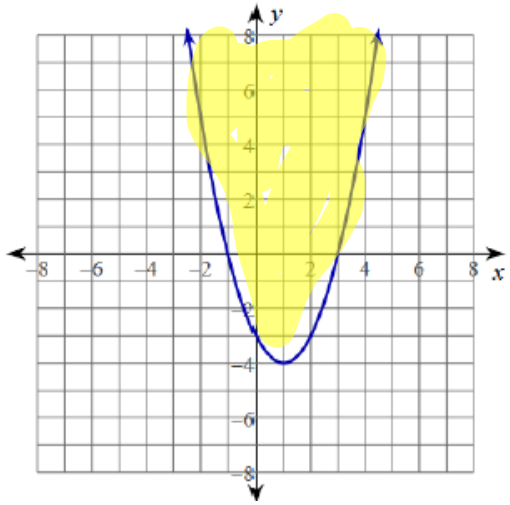
Example:

$y > x^2 - 2x - 3$

$y > (x-3)(x+1)$ factor.

$x = 3, -1$ roots

$(1, -4)$ vertex.



Test Point: (0,0)

Evaluate Test Point: $0 > f(0)$

$0 > -3$ ✓

Give three Possible Solutions: (1,1)

(1,4)

(2,2)

1. $x^2 - 4x - 12 \geq y$ equation.

(4)(4)

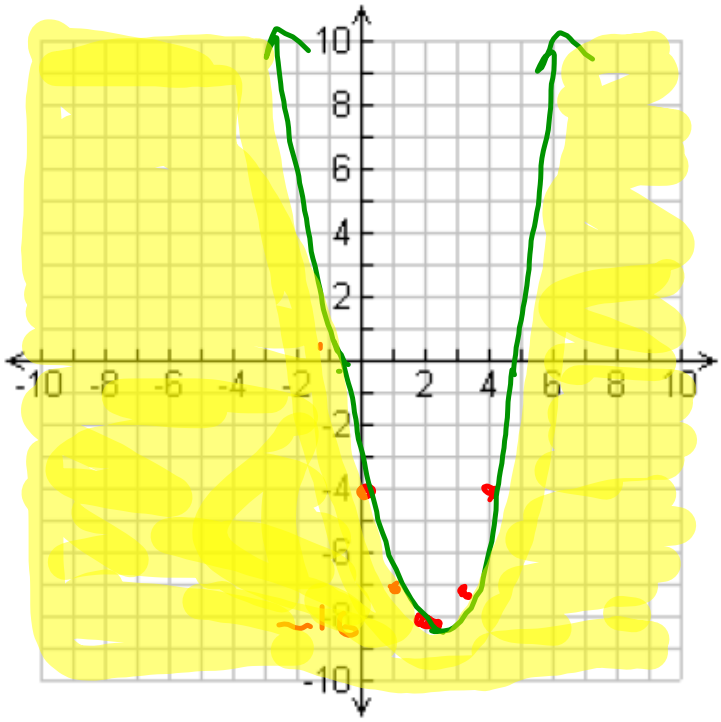
$(x-6)(x+2)$ factor.

$x = 6, -2$ roots

$(2, -16)$ vertex.

-12, -6, 2, -4

$x = \frac{6-2}{2} = 2$



Test Point: (0,0)

Evaluate Test Point: $0 \leq -12$ X

false

Give three Possible Solutions: (-4,-6)

(-2,-2)

(6,-6)

2. $x^2 + 4x + 4 < y$ equation.

$(x+2)(x+2)$ factor.

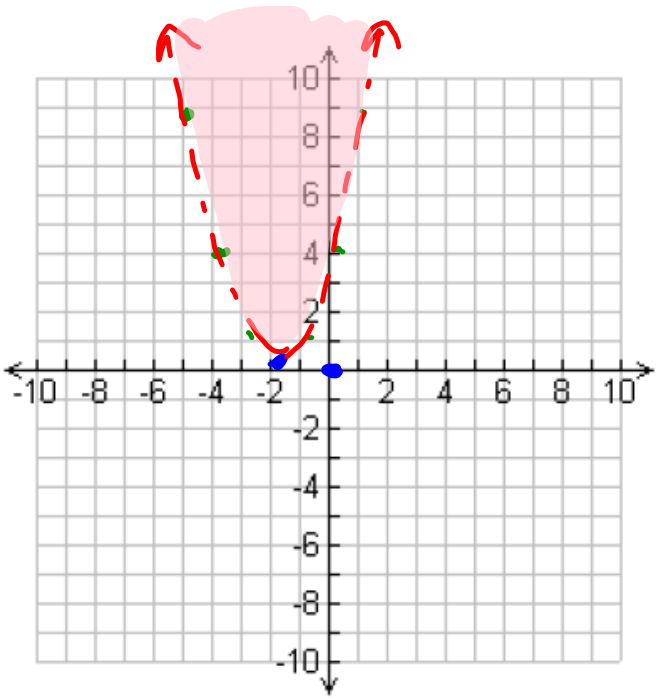
$x = -2$ roots

$(-2, 0)$ vertex.

4
2 2
4

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

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



Test Point: (0, 0)

Evaluate Test Point: $4 < 0$

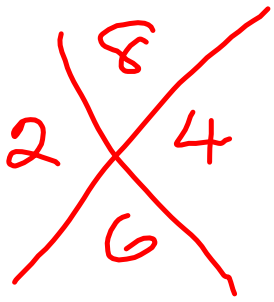
false

Give three Possible Solutions: (-2, 6)

(-1, 8)

(-2, 5)

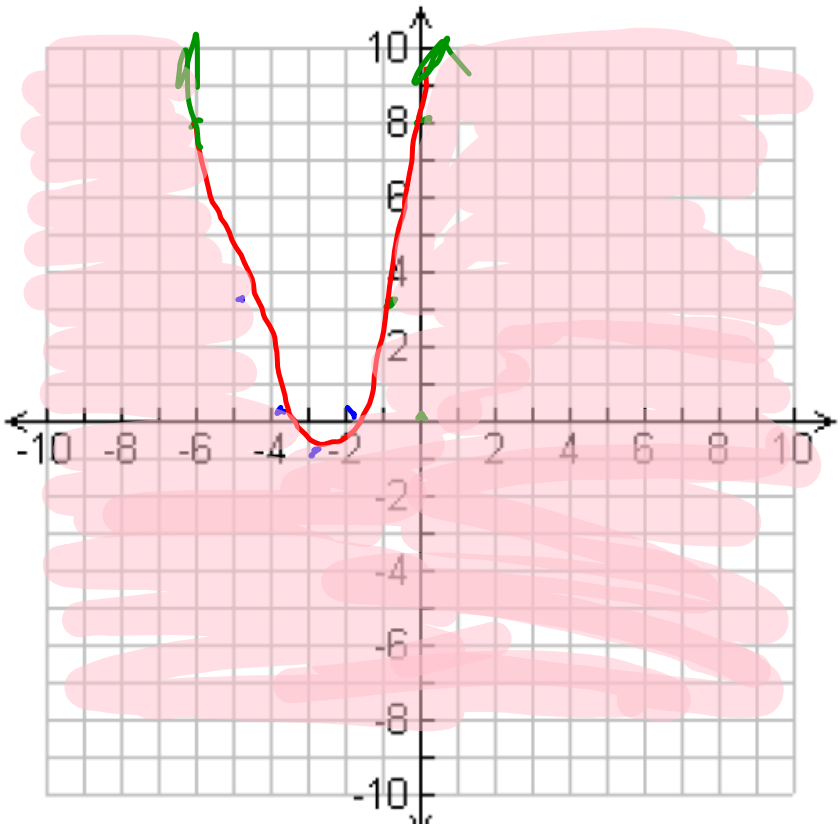
3. $x^2 + 6x + 8 \geq y$ equation.



$(x+2)(x+4)$ factor.

$x = -2, -4$ roots

$(-3, -1)$ vertex.



Test Point: $(0,0)$

Evaluate Test Point: $8 \geq 0$

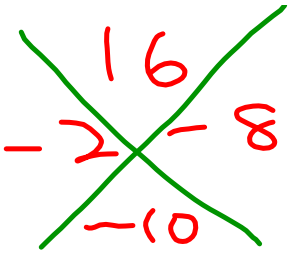
True

Give three Possible Solutions: $(-2,-3)$

$(-5,4)$

$(-6,1)$

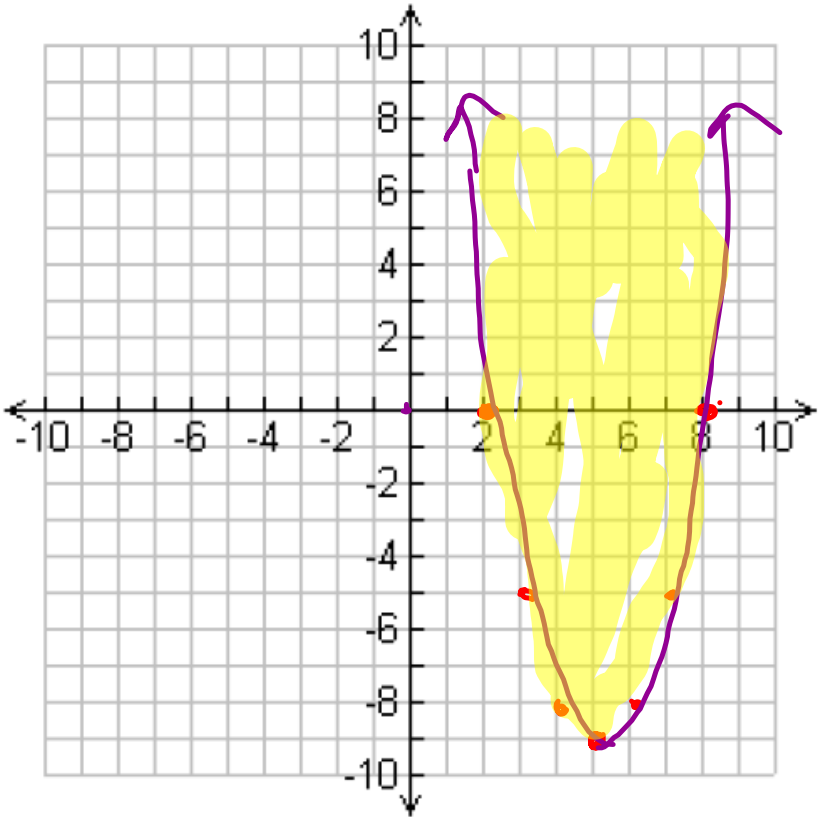
4. $x^2 - 10x + 16 \leq y$ equation.



$(x-2)(x-8)$ factor.

$x = 2, 8$ roots

$(5, -9)$ vertex.



Test Point: (x, y) (0, 0)

Evaluate Test Point: $16 \leq 0$

False

Give three Possible Solutions: (2, 0) (3, −4) (4, −1)