Algebra 2 4.8

Graph quadratic inequalities (functions)

Solve quadratic inequalities (equations) graphically

Solve quadratic inequalities (equations) algebraically

graph

solve

related function

vertex form

factored form

whiteboards

Quiz Fri. 4.7-4.8

$0 \leq 0+0+4$

Graph each inequality.

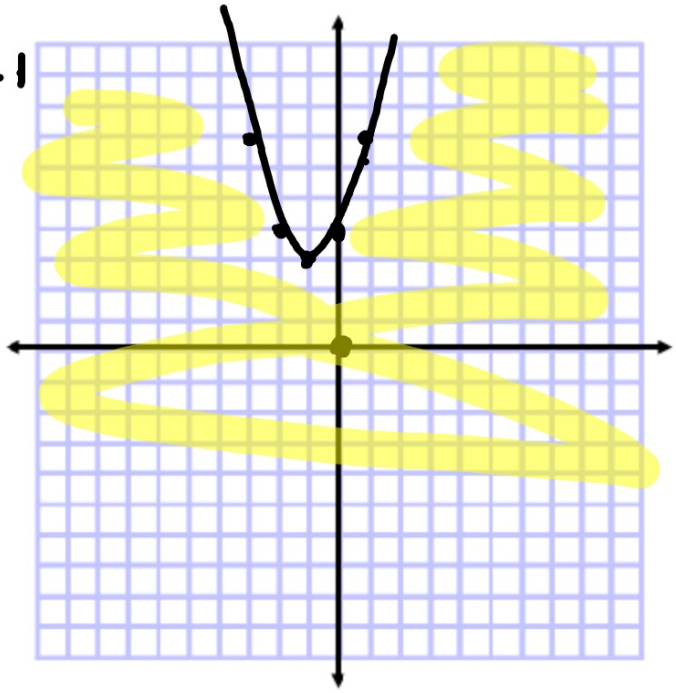
1A. $y \leq x^2 + 2x + 4$

$y = x^2+2x+1+4$

$y-4 = (x+1)^2$

$y-3 = (x+1)^2$

$y = (x+1)^2+3$



$y = (x-h)^2 + k$

Solve graphically

We need to know crossing points...how can we find them?

For which value(s) of x is the graph higher than zero?

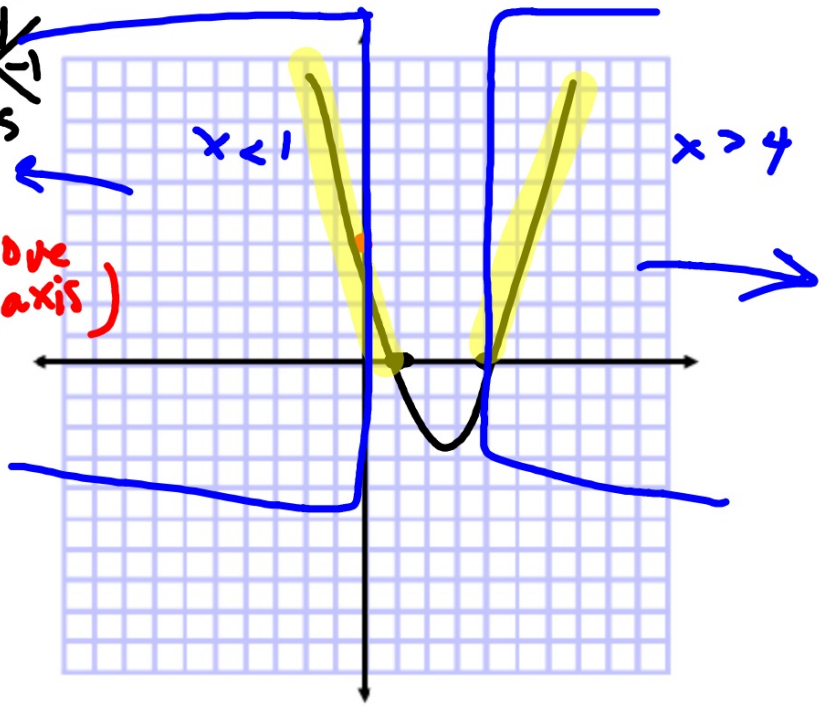
4. $0 < x^2 - 5x + 4$

4
-4
-1
-5

$x^2 - 5x + 4 > 0$ pos. (above x-axis)

$y = x^2 - 5x + 4$

$x = 4 \quad x = 1$



For which value(s) of x is the graph lower than zero?

5. $x^2 + 8x + 15 < 0$

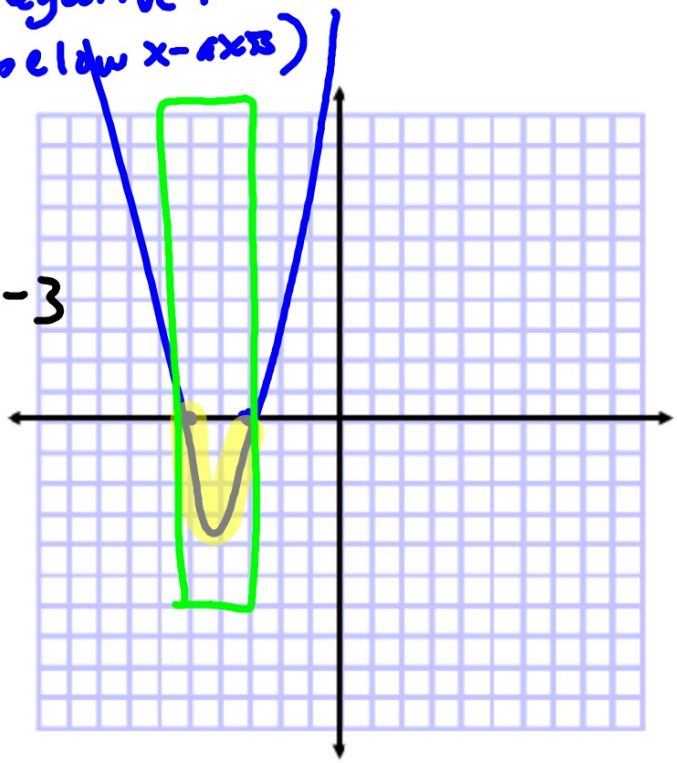
negative ?
(below x-axis)

$y = x^2 + 8x + 15$

15
5 × 3
8

$-5 < x < -3$

$x = -5 \quad x = -3$



Solve ~~algebraically~~ (another method):
Solve related equation
(DIVides number line into zones)
Test a point from each zone
Answers are the same as if solved graphically

$110 - 30 \leq 18$

Example 5 Solve a Quadratic Inequality Algebraically

Solve $x^2 - 3x \leq 18$ algebraically.

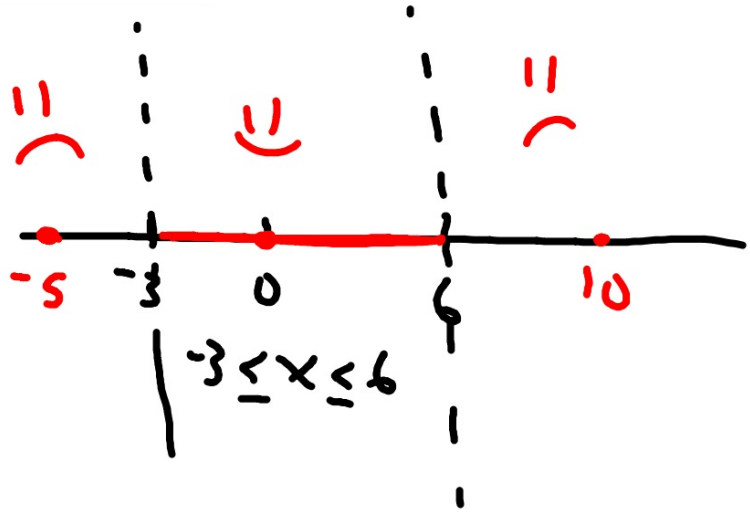
$x^2 - 3x = 18$

$x^2 - 3x - 18 = 0$

-18, -6, 3, -3

$(x-6)(x+3)=0$

$x=6 \quad x=-3$



$0+0 \stackrel{?}{<} -6$
$0 \not< -6$

GuidedPractice

Solve each inequality algebraically.

5A. $x^2 + 5x < -6$

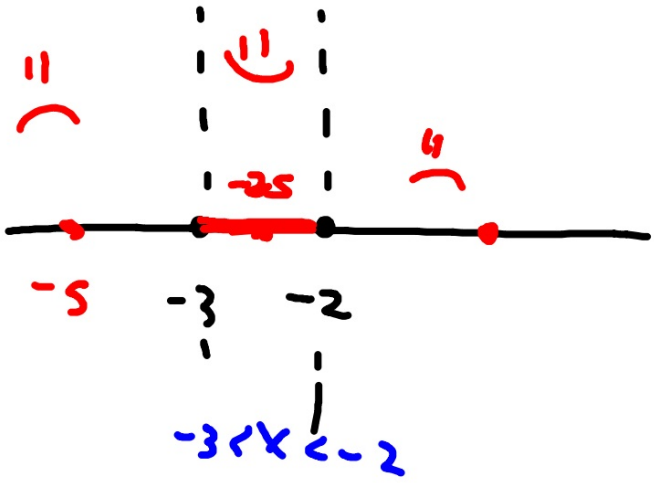
$x^2+5x=-6$

$x^2+5x+6=0$

$6 = 3 \cdot 2$, $5 = 3 + 2$

$(x+3)(x+2)=0$

$x=-3 \quad x=-2$



$100 + -110 + 30 \geq 0$

$20 \geq 0$

5B. $x^2 + 11x + 30 \geq 0$

$x^2 + 11x + 30 = 0$

$(x+6)(x+5) = 0$

30, 6, 5, 11

$x = -6 \quad x = -5$