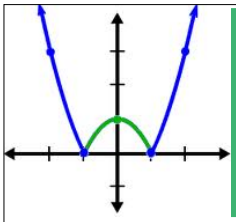
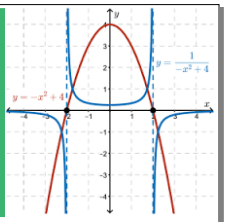


Unit 5: Absolute Values, Reciprocals, Systems, Inequalities



5.8 Graphing Quadratic Inequalities in One Variable

Since we only have one variable, the solution region will only be one-dimensional (x only). When we were shading a region of the cartesian plane, we were stating a two-dimensial solution region (x and y).

Ex.) Sketch and state the solution region:

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

factor

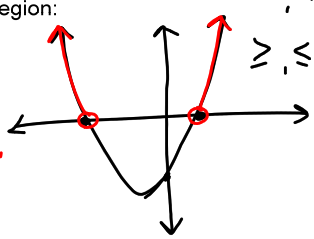
$(x-4)(x+1)>0$

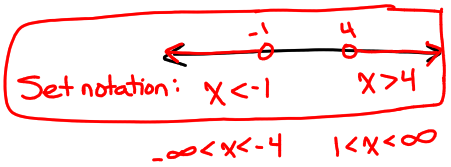
"graph > x-axis"

x-int: $x = 4, -1$

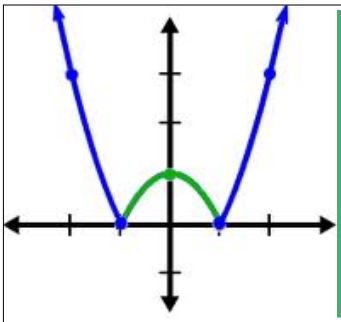
$>$, $<$ open dots ○

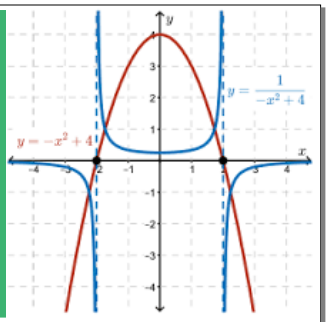
$\geq$, $\leq$ closed dots ●





$-\infty < x < -4$ $1 < x < \infty$

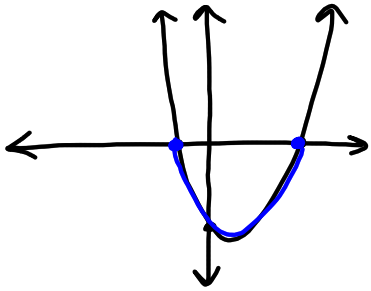


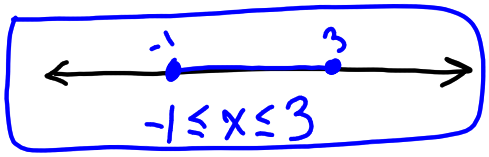


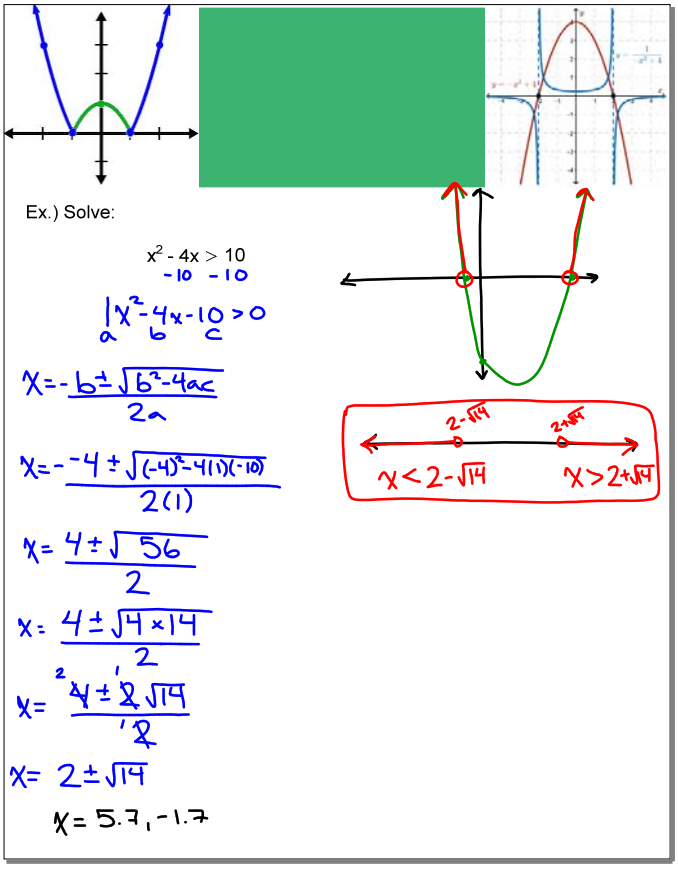
Ex.) Solve: "graph ≤ x-axis"

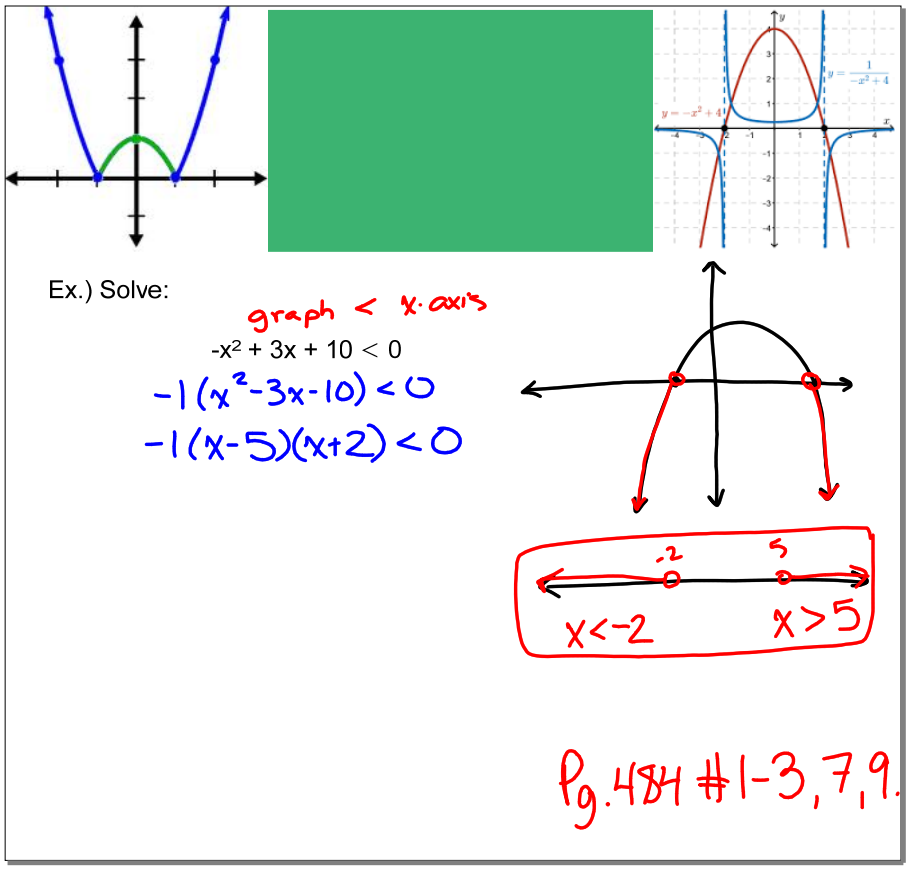
$x^2 - 2x - 3 \leq 0$

$(x-3)(x+1) \leq 0$






Ex.) Solve:
$x^2 - 4x > 10$
$-10 \quad -10$
$1x^2 - 4x - 10 > 0$
$a \quad b \quad c$
$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$
$x = \frac{-(-4) \pm \sqrt{(-4)^2-4(1)(-10)}}{2(1)}$
$x = \frac{4 \pm \sqrt{56}}{2}$
$x = \frac{4 \pm \sqrt{4 \times 14}}{2}$
$x = \frac{4 \pm 2\sqrt{14}}{2}$
$x = 2 \pm \sqrt{14}$
$x = 5.7, -1.7$
$2-\sqrt{14}$
$2+\sqrt{14}$
$x < 2-\sqrt{14}$
$x > 2+\sqrt{14}$


Ex.) Solve:
graph < x-axis
$-x^2 + 3x + 10 < 0$
$-1(x^2 - 3x - 10) < 0$
$-1(x-5)(x+2) < 0$
-2
5
$x < -2$
$x > 5$

Pg. 484 #1-3, 7, 9.