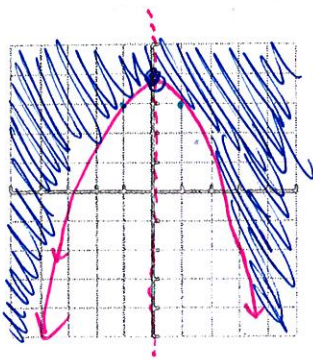


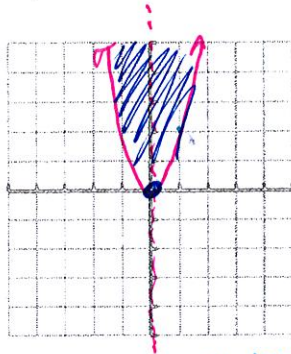
Graph each quadratic inequality.

1. $y \geq -x^2 + 4$

$x = \frac{-b}{2a}$
 $x = \frac{-0}{2 \cdot -1} = 0$
vertex
(0, 4)
y-int
(0, 4)

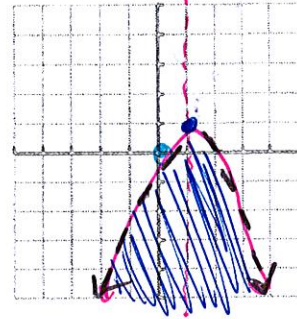


2. $y \geq 2x^2$



$x = \frac{-b}{2a} = \frac{0}{2 \cdot 2} = 0$
y-int (0, 0)
vertex (0, 0)

3. $y < -x^2 + 2x$



$x = \frac{-b}{2a} = \frac{-2}{2 \cdot -1} = 1$
y-int (0, 0)
vertex (1, 1)

Graph each quadratic inequality algebraically (using a number line). State the solution set in interval notation.

4. $3x^2 + 2x - 1 \geq 0$

$(3x-1)(x+1) = 0$

$x = 1/3 \quad x = -1$



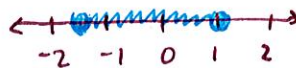
inequality sol: $x \leq -1 \cup x \geq 1/3$

interval sol: $(-\infty, -1] \cup [1/3, \infty)$

5. $0 \geq 2x^2 + x - 3$

$(2x+3)(x-1) = 0$

$x = -3/2 \quad x = 1$



inequality sol:

$-3/2 \leq x \leq 1$

interval sol:

$[-3/2, 1]$

6. $0 \leq -x^2 + 2x + 8$

$0 = -x^2 + 2x + 8$

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

$x = 4 \quad x = -2$



inequal. sol: $-2 \leq x \leq 4$

interval sol: $[-2, 4]$

7. $x^2 < 3x + 10$

$x^2 = 3x + 10$

$x^2 - 3x - 10 = 0$

$(x-5)(x+2) = 0$

$x = 5 \quad x = -2$



inequal sol:

$-2 < x < 5$

interval sol:

$(-2, 5)$

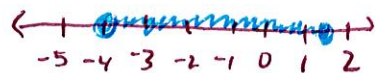
8. $2x^2 + 5x \leq 12$

$2x^2 + 5x = 12$

$2x^2 + 5x - 12 = 0$

$(2x-3)(x+4) = 0$

$x = 3/2 \quad x = -4$



inequ. sol: $-4 \leq x \leq 3/2$

interval sol: $[-4, 3/2]$

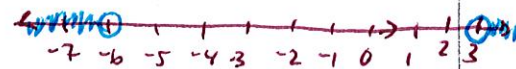
9. $x^2 + 3x > 18$

$x^2 + 3x = 18$

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

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

$x = -6 \quad x = 3$

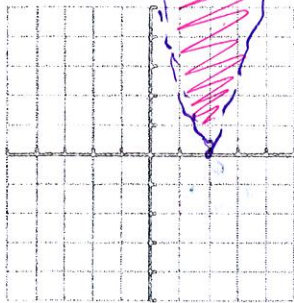


inequal. sol: $x < -6 \cup x > 3$

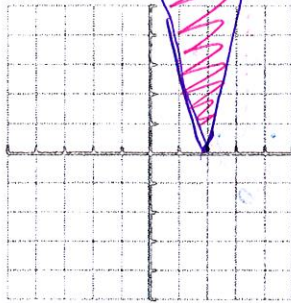
interval sol: $(-\infty, -6) \cup (3, \infty)$

Graph each quadratic inequality.

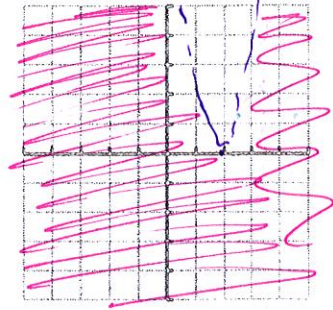
1. $y > 2(x-2)^2$



2. $y \geq 2(x-2)(x-2)$



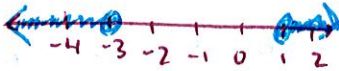
3. $y < 2x^2 - 8x + 8$



4. What do graphs #1-3 have in common? all the same except for inequality sign
- one quadratic written in the 3 different forms
 Solve each quadratic inequality algebraically (using a number line). State the solution set in interval notation.

5. $x^2 + 2x - 3 \geq 0$

$x^2 + 2x - 3 = 0$
 $(x+3)(x-1) = 0$
 $x = -3 \quad x = 1$



ineq. sol: $(-\infty, -3] \cup [1, \infty)$
 int. sol: $x \leq -3 \cup x \geq 1$

6. $9x^2 - 2 \leq -3x$

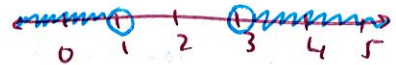
$9x^2 - 2 = -3x$
 $9x^2 + 3x - 2 = 0$
 ~~$(3x+1)(3x-2) = 0$~~ no factors
 $x = \frac{-3 \pm \sqrt{3^2 - 4(9)(-2)}}{2(9)} = \frac{-2}{3} \pm \frac{1}{2}$



ineq. sol: $-\frac{2}{3} \leq x \leq \frac{1}{2}$
 int. sol: $[-\frac{2}{3}, \frac{1}{2}]$

7. $2x^2 - 8x > -6$

$2x^2 - 8x = -6$
 $2x^2 - 8x + 6 = 0$
 $2(x^2 - 4x + 3) = 0$
 $2(x-3)(x-1) = 0$
 $x = 3, 1$

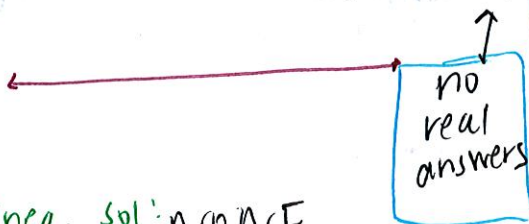


ineq. sol: $x < 1 \cup x > 3$
 int. sol: $(-\infty, 1) \cup (3, \infty)$

8. $\frac{1}{2}x^2 + 3x \leq -6$

$\frac{1}{2}x^2 + 3x = -6$ $a = \frac{1}{2}$
 $\frac{1}{2}x^2 + 3x + 6 = 0$ $b = 3$
 ~~$x^2 + 6x + 12 = 0$~~ $c = 6$
doesn't factor

$x = \frac{-3 \pm \sqrt{3^2 - 4(\frac{1}{2})(6)}}{2(\frac{1}{2})} = \frac{-3 \pm \sqrt{-3}}{1}$



ineq. sol: NONE
 int. sol:

9. $-2x^2 - 50 \geq -20x$

$-2x^2 + 20x - 50 = 0$
 $-2(x^2 - 10x + 25) = 0$
 $-2(x-5)(x-5) = 0$
 $x = 5$



ineq. sol: $x = 5$
 int. sol: $[5]$

10. $7x^2 - 8x > 0$

$7x^2 - 8x = 0$
 $x(7x - 8) = 0$
 $x = 0, 8/7$



ineq. sol: $x < 0 \cup x > 8/7$
 int. sol: $(-\infty, 0) \cup (8/7, \infty)$