

Lesson 2.5 Objective: SWBAT solve and graph quadratic inequalities.

Kickoff- Take out your weekly homework quiz and factor each of the following.

1) $r^2 - 20r + 100$ (10, 10) $(r - 10)(r - 10)$
 2) $n^2 - 13n + 40$ $(n - 8)(n - 5)$
 3) $5n^2 + 18n + 16$ $80n^2$
 $5n^2 + 10n + 8n + 16$
 $5n(n+2) + 8(n+2)$
 $(5n+8)(n+2)$

Solving Quadratic Inequalities

- 1) Write in the form $ax^2 + bx + c = 0$
- 2) Solve the quadratic (any method)
- 3) Graph the roots on the # line.
- 4) Use test points in order to shade.
- 5) Shade + write answer in the proper notation (interval notation)

Examples:

1) $x^2 > x + 2$
 $-x^2 - x - 2$
 $x^2 - x - 2 > 0$
 $(x-2)(x+1) > 0$
 $(x-2=0 \quad x+1=0)$
 $x=2 \quad x=-1$
 $(-\infty, -1) \cup (2, \infty)$

2) $(x+3)^2 \geq 2(x^2+7)$
 $x^2 + 3x + 3x + 9 \geq 2x^2 + 14$
 $-x^2 - 6x + 9 \geq 2x^2 + 14$
 $0 \geq x^2 - 6x + 5$
 $0 \geq (x-1)(x-5)$
 $0 = x-1 \quad 0 = x-5$
 $x=1 \quad x=5$
 $[1, 5] \quad 1 \leq x \leq 5$

3) $x^2 > x + 2$
 $(x-2)(x+1) > 0$
 $4 > 0$
 $x < -2$ or $x > 2$

4) $(x+3)^2 \geq 2(x^2+7)$
 $(0+3)^2 \geq 2(0^2+7)$
 $9 \geq 14$
 $(3+3)^2 \geq 2(3^2+7)$
 $36 \geq 32$
 $(6+3)^2 \geq 2(6^2+7)$
 $81 \geq 86$

3) $x^2 \geq 4(x-5)$ \mathbb{R}
 $x^2 \geq 4x - 20$
 $x^2 - 4x + 20 \geq 0$
 $x^2 - 4x + 20 = 0$
 $-20 \quad -20$
 $x^2 - 4x + 4 = -20 + 4$
 $\sqrt{(x-2)^2} = \sqrt{-16}$
 IMAGINARY

4) $6(x^2 + 1) \geq -13$ \mathbb{R}
 $6x^2 + 6 \geq -13$
 $+13 \quad +13$
 $6x^2 + 19 \geq 0$
 $-0 \pm \sqrt{0^2 - 4(6)(19)}$
 $2(6)$
 $-0 \pm \sqrt{-456}$
 12
 IMAGINARY

Practice:

1) $y^2 - 17y + 70 < 0$

2) $a^2 + 3a + 2 < -3(a + 2)$

3) $b(b + 3) \geq -2$

4) $2d^2 + 5d \leq 12$

5) $3x^2 + 7x \leq -2$