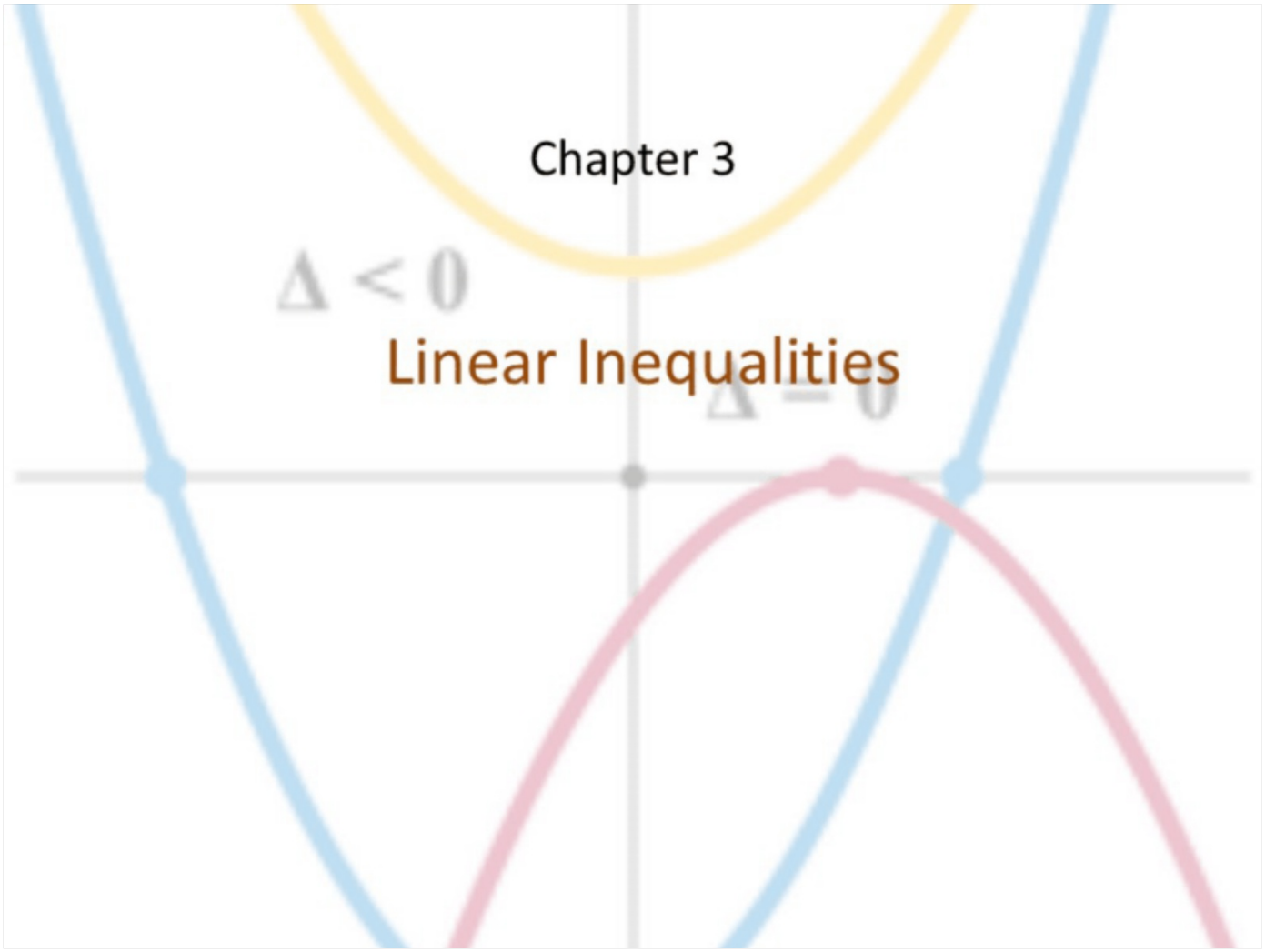

Chapter 3
$\Delta < 0$
Linear Inequalities
$\Delta = 0$

Objective

Students will…

- Be able to use inverse operations to solve linear inequalities.

Inequalities

Recall that inequalities can be represented in 4 different ways:

1. "less than" $<$
2. "greater than" $>$
3. "less than or equal to" $\leq$
4. "greater than or equal to" $\geq$

It can also represented in a compound inequality, i.e. mixture of any two.

Ex. $2 < x < 9$

3? ✓
5? ✓
9? ✗

$-4 \leq x < 8$

0? ✓
7? ✓
-4? ✓
8? ✗

Solution vs A Range of Solution

Also recall that inequalities will give a **range of solution**, rather than just a discreet number of solutions.

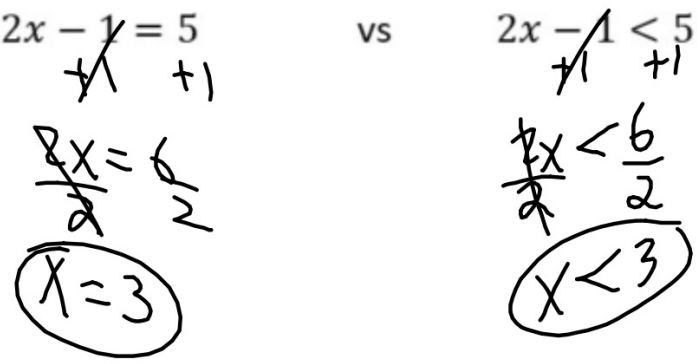
Ex. $x = 2$ vs $x < 2$

Note: This is the reason why inequality graphs have a **shaded region**, rather than a line or a point.

Solving Algebraic Inequalities

What is neat is that solving algebraic inequalities follow the general rules used when solving algebraic equations (for the most part), i.e. inverse operations! In other words, you can just imagine there being an equal sign and solve the way you normally would, and then write the inequality afterwards. The only important new rule is to **switch the inequality sign** whenever we **multiply or divide** by a negative quantity.

ex. $2x - 1 = 5$ vs $2x - 1 < 5$



Examples

a. $-x + 2 > 5$

$-2 \quad -2$

$\frac{-x}{-1} > \frac{3}{-1}$

$x < -3$

b. $\frac{3}{4}x + 4 \leq -2$

$-4 \quad -4$

$4 \cdot \frac{3}{4}x \leq (-6)4$

$\frac{3x}{3} \leq \frac{-24}{3}$

$x \leq -8$

Examples

c. $-7(1+7p) \geq 336$

$\frac{-7}{-7} \quad \frac{}{-7}$

$1+7p \leq -48$

$-1 \qquad -1$

$7p \leq -49$

$\frac{7p}{7} \leq \frac{-49}{7}$

$p \leq -7$

d. $-5+5x < 1-5x+4$

$+5 \quad +5x \qquad +5x \quad +5$

$\frac{10x}{10} < \frac{10}{10}$

$x < 1$

$-5+5x < 1-5x+4$

$-5x \qquad -5x$

$-1 \quad -4$

$\frac{-10}{-10} < \frac{-10x}{-10}$

$1 > x$

Homework Due 10/30

Solving Linear Inequalities WKSHT