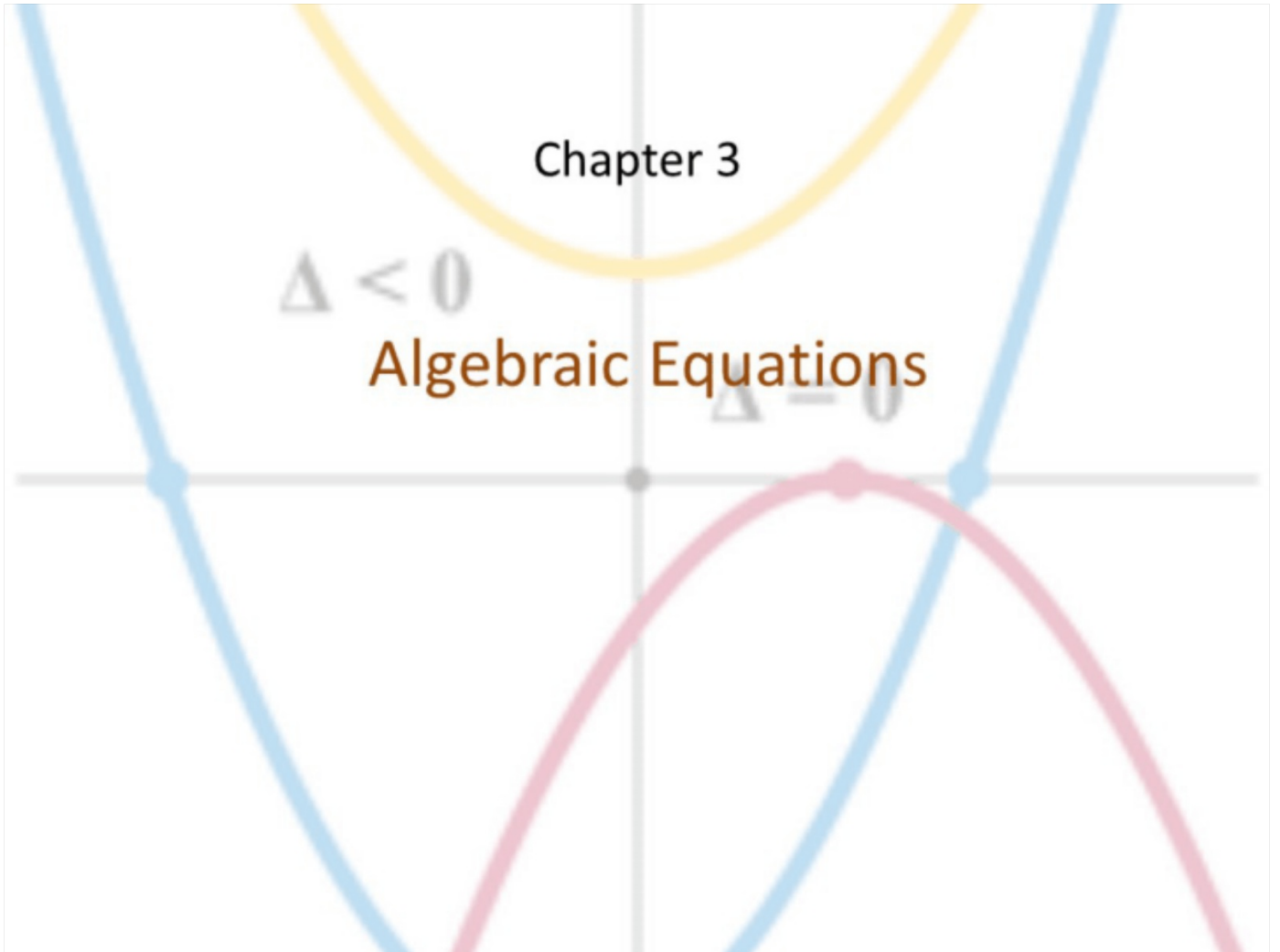


Chapter 3

$\Delta < 0$

Algebraic Equations

$\Delta = 0$



Objective

Students will...

- Be able to use inverse operations to solve algebraic equations.
- Be able to solve radical and higher order polynomial equations.

Algebraic Equations

The most useful application of algebra is its abilities to help solve equations. Recall, that we can solve (or isolate a variable) by using inverse operations.

Solve for x .

$$\text{Ex. } 5 = 3x + 4$$

$$\quad \quad \quad -4 \quad \quad \quad -4$$

$$\frac{1}{3} = \frac{1}{3}x$$

$$x = \frac{1}{3}$$

Solve for g

$$\text{Ex. } st = \pi r^2 + gt$$

$$\quad \quad \quad -\pi r^2 \quad \quad \quad -\pi r^2$$

$$\frac{st - \pi r^2}{t} = \frac{gt}{t}$$

$$g = \frac{st - \pi r^2}{t}$$

$$C = 2\pi r$$

$$C = \frac{\pi d}{1}$$

$$\pi = \frac{C}{d}$$

Note: When we solve equations, we go in reverse order of operation. Just think "outside-in."

$$2^2 = 4$$
$$\sqrt{4} = 2$$

Exponents and Radicals

As addition is the inverse of subtraction (and vice-versa), and multiplication is the inverse of division (and vice-versa), remember that exponents, or taking a power, is the inverse of radicals, or taking roots.

Solve for x .

$$\text{Ex } (4)^2 = (\sqrt{x-3})^2$$

$$16 = x - 3$$
$$+3 \quad +3$$

$$x = 19$$

$$\text{Ex. } x^6 - 2 = 8$$
$$+2 \quad +2$$

$$\sqrt[6]{x^6} = \sqrt[6]{10}$$
$$x = \pm \sqrt[6]{10}$$

$$\approx 1.47 \dots$$

Solving Rational Equations

When solving any rational equations (i.e. involving one or more fractions), one of the most useful techniques is to use "cross-multiplication."

Ex. $\frac{4}{(x+3)} \times \frac{5}{9}$

$$36 = 5(x+3)$$

$$36 = 5x + 15$$

$$\frac{21}{9} = \frac{x}{9}$$

$$x = \frac{21}{9}$$

Ex. $\frac{x-5}{-x-1} \times \frac{2}{x+1}$

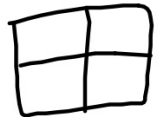
$$2(-x-1) = (x-5)(x+1)$$

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

$$-7x-2 = x^2 - 4x - 5$$

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

$$x = 3, -1$$



Homework Due 10/22

Solving EQ WKSHT