

## Algebra 1 - Lesson 7.4 Solving Polynomial Equations

Warmup: Factor the expression  $x^2 + 5x - 14$

$$(x-2)(x+7)$$

multiplies to  
give -14  
adds to give  
5

Why Products are better for solving equations:

Think about the possible solutions for  $x$  and  $y$  in the following equations.

$$x + y = 0$$

$$-1 + 1 = 0$$

$$-2 + 2 = 0$$

$$-3 + 3 = 0$$

$$0 + 0 = 0$$

infinite choices  
for  $x/y$ .

$$xy = 0$$

Either  $x$  is 0

or  $y$  is 0

Solving Polynomial Equations.Ex: Solve the equation:  $x^2 - 3x = 28$ 1. Get it equal to Zero.  $x^2 - 3x - 28 = 0$ 2. Then convert it to a Product. Factor what youhave.  $x^2 - 3x - 28$ 

$$(x-7)(x+4)$$

multiplies to  $-28$ adds to give  $-3$ 

$$-7 \text{ \& } 4$$

3. Then Solve.

$$\underbrace{(x-7)} \cdot \underbrace{(x+4)} = 0$$

Set each factor  
equal to 0 & solve  
them.

$$x-7=0$$
$$+7 \quad +7$$

$$x=7$$

$$x+4=0$$
$$-4 \quad -4$$

$$x=-4$$

## 7.4 Plus Extra - Taught after 7.5

Ex: Solve  $x^2 + 54 = -15x$

Step 1: Get = 0

$$x^2 + 54 = -15x$$

$+15x$     $+15x$

$$x^2 + 15x + 54 = 0$$

Step 2: Convert to product (Factor)

$$(x+6)(x+9) = 0$$

multiplies to 54  
adds to 15

9 & 6

Step 3. Solve.

Set each factor = 0 & solve.

$$x+6=0$$

$-6$     $-6$

$$x = -6$$

$$x+9=0$$

$-9$     $-9$

$$x = -9$$

## 7.4 Plus Extra - Taught after 7.5

Ex: Solve  $x^2 - 11x + 14 = -10$   
 $+10 \quad +10$

$$x^2 - 11x + 24 = 0$$

$$(x-3)(x-8) = 0$$

$$x-3 = 0$$

$$x = 3$$

$$x-8 = 0$$

$$x = 8$$

Step 1. ✓

Step 2. ✓

Step 3 ✓

## 7.4 Plus Extra - Taught after 7.5

Homework:

7.4 Worksheet