

### Multiplying Polynomials #3 Notes

Example 1: Solve an equation with polynomials on both sides

$$y(y - 12) + y(y + 2) + 25 = 2y(y + 5) - 15$$

Let's start by distributing.

$$y^2 - 12y + y^2 + 2y + 25 = 2y^2 + 10y - 15$$

\*\*Remember that when we are distributing we are multiplying. This means that exponents will be added together.

Keeping the sides of our equation separate, let's combine like terms.

$$\begin{array}{r} y^2 - 12y + y^2 + 2y + 25 \\ y^2 + y^2 \quad -12y + 2y \quad +25 \end{array} = 2y^2 + 10y - 15$$

No like terms on this side, so we leave it as is

$$2y^2 - 10y + 25 = 2y^2 + 10y - 15$$

Now, we should start solving the equation.

$$2y^2 - 10y + 25 = 2y^2 + 10y - 15$$

$$\begin{array}{r} -2y^2 \quad \quad -2y^2 \\ -10y + 25 = 10y - 15 \end{array} \quad \text{**The } 2y^2 \text{ term cancels out on both sides of the equation.}$$

$$-10y + 25 = 10y - 15$$

$$+10y \quad \quad +10y$$

$$25 = 20y - 15$$

$$+15 \quad \quad +15$$

$$40 = 20y$$

$$\frac{40}{20} = \frac{20y}{20}$$

$$2 = y$$

Example 2: Solve an equation with polynomials on both sides

$$2x(x + 4) + 7 = -(x + 8) + 2x(x + 1) + 12$$

Let's start by distributing. The  $-(x + 8)$  will act like a  $-1(x + 8)$ .

$$2x^2 + 8x + 7 = -x - 8 + 2x^2 + 2x + 12$$

\*\*Remember that when we are distributing we are multiplying. This means that exponents will be added together.

Keeping the sides of our equation separate, let's combine like terms.

$$2x^2 + 8x + 7 = -x - 8 + 2x^2 + 2x + 12$$

$$\begin{array}{cccc} \text{No like terms} & 2x^2 & -x + 2x & -8 + 12 \end{array}$$

on this side, so

we leave it as is

$$2x^2 + 8x + 7 = 2x^2 + x + 4$$

Now, we should start solving the equation.

$$2x^2 + 8x + 7 = 2x^2 + x + 4$$

$$\begin{array}{ccc} -2x^2 & -2x^2 & \text{**The } 2x^2 \text{ term cancels out on both sides of the equation.} \end{array}$$

$$8x + 7 = x + 4$$

$$\begin{array}{cc} -8x & -8x \end{array}$$

$$7 = -7x + 4$$

$$\begin{array}{cc} -4 & -4 \end{array}$$

$$-3 = -7x$$

$$\frac{-3}{-7} = \frac{-7x}{-7}$$

$$\frac{3}{7} = x$$