

# Agenda

## Homework:

- Zero Product Property WS
- AM

## Materials:

- Notebook

## Do Now:

Take out homework

- ① Factor out the GCF of  $2x^3y - 6xy + 18y^2$
- ② Factor the quadratic:  $x^2 - 2x - 24$

# Do Now

Factor out the GCF of  
 $-2x^2 + 4x + 48$

Factor the quadratic:  
 $x^2 - 2x - 24$



# Set up Toolbox Notes (see example below)

<b>Name:</b> <b>Date:</b> <b>Period:</b> <b>Topic:</b> Solving Quadratics – Zero Product Property	
<b>Toolbox:</b> <i>(leave about 10 lines)</i> $(2x+3)(3x-8) = 0$	<b>Summary/Reflection:</b>
<b>Study Questions:</b> $\begin{array}{r} 2x+3=0 \\ -3 \quad -3 \\ \hline \end{array}$	<b>Workspace:</b> $\frac{2x}{2} = \frac{-3}{2}$ $x = -\frac{3}{2}$



## Toolbox

# Topic: Zero-Product Property (Solving Quadratics)

### Zero Product Property

- Used to solve equations of the form  $ab=0$
- If the PRODUCT of two factors is 0, then **at least ONE** of the factors must equal to 0
- Therefore, set each factor equal to 0 and solve using inverse operations

$$\# \cdot \# = 0$$

What value of  $x$  would make the following polynomial equal to 0?

$$x^2 - 4x + 4 = 0$$

~~$x=0$~~       $0^2 - 4(0) + 4 = 4$

~~$x=4$~~       $4^2 - 4(4) + 4 = 4$

~~$x=1$~~       $1^2 - 4(1) + 4 = 1$

~~$x=-1$~~       $(-1)^2 - 4(-1) + 4 = 9$

~~$x=-4$~~       $(-4)^2 - 4(-4) + 4 \neq 0$

$x=2$       $(2)^2 - 4(2) + 4 = 0$

Solve  $x^2 - 4x + 4 = 0$  using the Zero Product Property



$x=2$

$$\begin{array}{r} 4 \\ -2 \quad -2 \\ \hline -4 \end{array}$$

$$x^2 - 4x + 4 = 0$$

$$(x-2)(x-2) = 0$$

Z.P.P.

$$\begin{array}{r|l} x-2 & = 0 \\ +2 & +2 \\ \hline x & = 2 \end{array}$$

$$\begin{array}{r|l} x-2 & = 0 \\ +2 & +2 \\ \hline x & = 2 \end{array}$$

Solve  $x^2 - 8x + 15 = 0$  using the Zero



Product Property

$$\begin{array}{r} 15 \\ -5 \quad -3 \\ \hline -8 \end{array}$$

$$x^2 - 8x + 15 = 0$$

$$(x - 5)(x - 3) = 0$$

Z.P.P.

$$\begin{array}{r} x - 5 = 0 \\ +5 \quad +5 \\ \hline x = 5 \end{array}$$

$$\begin{array}{r} x - 3 = 0 \\ +3 \quad +3 \\ \hline x = 3 \end{array}$$



$$\text{Solve } 2x^2 - 16x - 18 = 0$$

$$\begin{array}{r} -9 \\ -9 \times +1 \\ \hline -8 \end{array}$$

$$\frac{2x^2}{2} - \frac{16x}{2} - \frac{18}{2} = 0$$

$$2(x^2 - 8x - 9) = 0$$

$$2(x-9)(x+1) = 0$$

Z.P.P.

$$x-9=0$$

$$x=9$$

$$x+1=0$$

$$x=-1$$





Solve  $x^2 - 12x = -32$

~~$\begin{array}{r} 32 \\ -8 \quad -4 \\ \hline -12 \end{array}$~~

$$\begin{array}{r|l} x^2 - 12x + 0 = -32 & \\ +32 & +32 \\ \hline \end{array}$$

$$x^2 - 12x + 32 = 0$$

Z.P.P.

$$(x - 8)(x - 4) = 0$$

$$x - 8 = 0$$

$$x = 8$$

$$x - 4 = 0$$

$$x = 4$$



Solve  $3x^2 - 8x = 2x^2 - x + 18$

$$\begin{array}{r} -2x^2 + x \\ \hline x^2 - 7x - 18 = 0 \end{array}$$

$$(x-9)(x+2) = 0$$

Z.P.P

$$x-9=0$$
$$x=9$$

$$x+2=0$$
$$x=-2$$

# Mini Quiz

① Solve the quadratic  $x^2 + 4x - 77 = 0$

② Solve the quadratic  $2x^2 - 8x - 24 = 0$