

## Chapters 7 & 8

### Chapter 7:

- Factor equations using greatest common factor
- Factor equations of the form  $x^2 + bx + c$  and  $ax^2 + bx + c$

### Chapter 8:

- Solve factored equations using the zero product property
- Solve quadratic equations using factoring, square roots, and the Quadratic Formula
- Know the quadratic formula
- Know what an axis of symmetry is and what the formula for axis of symmetry is
- Solve story problems using factoring

Factor each polynomial. Check your answer. Factor w/ GCF (greatest common factor)

**A**  $4x^2 - 3x$   
 $x(4x - 3)$

\*what do the terms have in common?

$10y^3 + 20y^2 - 5y$   
 $5y(2y^2 + 4y - 1)$

**C**  $-12x - 8x^2$   
 $-4x(3 + 2x)$

Mandy's calculator is powered by solar energy. The area of the solar panel is  $(7x^2 + x)$  cm<sup>2</sup>. Factor this polynomial to find possible expressions for the dimensions of the solar panel.

$7x^2 + x$   
 $x(7x + 1)$

Factor each trinomial. Check your answer.

**A**  $x^2 + 6x + 8$

$$(x + 4)(x + 2)$$

$x^2 - 10x + 16$

$$(x - 8)(x - 2)$$

Factor each trinomial.

**A**  $x^2 + 7x - 18$

X

**B**  $x^2 - 5x - 24$

X

Factor each trinomial. Check your answer.

**A**  $2x^2 + 11x + 12$

$(2x+3)(x+4)$

2	12	$\overset{0}{I}^+$
$2 \cdot 1$	$1 \cdot 12$	$2 \cdot 4$
$2 \cdot 6$	$3 \cdot 4$	$1 \cdot 3$

**C**  $2x^2 - 7x - 15$



**B**  $5x^2 - 14x + 8$

$(5x-4)(x-2)$

5	8	$\overset{0}{I}^+$
$1 \cdot 5$	$-1 \cdot -8$	$5 \cdot -2$
$-2 \cdot -4$		$1 \cdot -4$

$\rightarrow (5x - 4)(x - 2)$

## Chapter 8

~~\*~~ Zero Product Property: factor the equations, then set each set equal to 0 and solve for x.

→ SOLVE for x

Use the Zero Product Property to solve each equation. Check your answer.

**A**  $(x-3)(x+7) = 0$

$$\begin{array}{l} x-3=0 \\ +3 \quad +3 \\ \hline x=3 \end{array} \quad \begin{array}{l} x+7=0 \\ -7 \quad -7 \\ \hline x=-7 \end{array}$$

**B**  $(x)(x-5) = 0$

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

Solve each quadratic equation by factoring. Check your answer.

**A**  $x^2 + 7x + 10 = 0$

$$(x+2)(x+5)$$

$$x+2=0 \quad x+5=0$$

$$x = -2$$

$$x = -5$$

$$x^2 + 2x = 8$$

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

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

$$(x+4)(x-2)$$

$$x+4=0$$

$$x-2=0$$

$$x = -4$$

$$x = 2$$

→ must be set  
★ equal to 0!

Solve using square roots.

**A**  $\sqrt{x^2} = \sqrt{16}$

↳ always a + & - !

$x = \pm 4$

$4^2 = 16$   
 $(-4)^2 = 16$

Solve using square roots.

**A**  $x^2 + 5 = 0$   
 $-5 \quad -5$

$\sqrt{x^2} = \sqrt{-5}$

$x = \text{no real solutions}$

\* can't take the square root of a negative #  
 (no real solutions)

Solve the equation  $0 = -2x^2 + 80$ . Round to the nearest hundredth.

Know and use the Quadratic Formula!

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

↳ simplify  
according to  
PEMDAS



→ must be equal to 0 first

Solve using the Quadratic Formula.

★ **A**  $2x^2 + 3x - 5 = 0$

$a=2$   $b=3$   $c=-5$

$$X = \frac{-3 \pm \sqrt{3^2 - 4(2)(-5)}}{2(2)}$$

$$X = \frac{-3 \pm \sqrt{49}}{4}$$

$$\frac{-3 \pm 7}{4}$$

$$X = 1, -2.5$$

**B**  $2x = x^2 - 3$


$-2x$   $-2x$


$0 = x^2 - 2x - 3$

$a=1$   $b=-2$   $c=-3$

$$-3x^2 + 5x + 2 = 0$$

$$2 - 5x^2 = -9x$$

 Axis of Symmetry: cuts a parabola in half; the vertex lies on the axis of symmetry

 Formula for  
axis of symmetry:  $x = \frac{-b}{2a}$