

October 2

## Factor a Trinomial

(EX) Factor:  $x^2 + 6x + 8$

Step 1: Multiply first and last terms.

$$x^2 \cdot 8 = 8x^2$$

Step 2: Find factors that add up to middle term.

$$\boxed{4x + 2x} = 6x$$

Factors of 8:

$$\begin{array}{ll} \textcircled{4 \cdot 2} & -4 \cdot -2 \\ 1 \cdot 8 & -1 \cdot -8 \end{array}$$

Step 3: Replace middle term with both factors.

$$\frac{x^2}{x} + \frac{4x}{x} + \frac{2x}{2} + \frac{8}{2}$$

Step 4: Divide down the middle.

Step 5: Pull GCF out of both sides. (Inside parenthesis must match)

$$\textcircled{x}(x+4) \quad \textcircled{2}(x+4)$$

Step 6: Write factors. Parenthesis are one. GCFs build other one.

$$\boxed{(x+4)(x+2)}$$

Ex2 Factor:  $6m^2 - 13m - 5$

$$6m^2 \cdot -5 = -30m^2$$

$$\boxed{-15m + 2m} = -13m$$

Factors of -30:

$6 \cdot -5$	$-6 \cdot 5$
$-10 \cdot 3$	$-3 \cdot 10$
$-1 \cdot 30$	$-30 \cdot 1$
$\boxed{-15 \cdot 2}$	$-2 \cdot 15$

$$\frac{6m^2}{3m} - \frac{15m}{3m} \mid \frac{+2m}{1} - \frac{5}{1}$$

$$\boxed{3m}(2m - 5) \quad \boxed{1}(2m - 5)$$

$$\boxed{(2m - 5)(3m + 1)}$$

Ex3 Factor:  $\frac{6b^2}{3} - \frac{39b}{3} + \frac{60}{3}$  GCF: 3

$$3(\boxed{2b^2} - 13b + \boxed{20})$$

$$2b^2 \cdot 20 = 40b^2$$

$$\boxed{-8b + -5b} = -13b$$

Factors of 40:

$20 \cdot 2$	$-20 \cdot -2$
$8 \cdot 5$	$\boxed{-8 \cdot -5}$
$1 \cdot 40$	$-1 \cdot -40$
$10 \cdot 4$	$-10 \cdot -4$

$$\frac{2b^2}{2b} - \frac{8b}{2b} \mid \frac{-5b}{-5} + \frac{20}{-5}$$

$$\boxed{2b}(b - 4) \quad \boxed{-5}(b - 4)$$

$$\boxed{(b - 4)(2b - 5)}$$