

8.5-8.6 INTRO TO FACTORING TRINOMIALS

To factor a trinomial means to try to find what two binomials would multiply together to create the trinomial.

$$\begin{array}{c}
 \downarrow \quad \checkmark \quad \downarrow \\
 3x^2 + 13x + 4 = (3x + 1)(x + 4) \\
 3x^2 \boxed{+ 12x + x} + 4
 \end{array}$$

Example 1

Factor $x^2 + 3x + 2$.

$$\begin{array}{c}
 (x + 1)(x + 2) \\
 x^2 \boxed{+ 2x + x} + 2
 \end{array}$$

Example 2

Factor $8 - 9y + y^2$.

$$(1 - y)(8 - y)$$
$$8 - y - 8y + y^2$$

Example 3

Factor $g^2 - 6gh - 16h^2$.

$$(g - 8h)(g + 2h)$$
$$g^2 + 2gh - 8gh - 16h^2$$

Example 4

Solve $2c^2 + 7c + 6 = 0$.

$$\underline{(2c+3)} \underline{(c+2)} = 0$$

$$2c^2 + \underline{4c + 3c} + 6$$

$$\begin{array}{r} 2c+3=0 \\ -3 \quad -3 \\ \hline \end{array}$$

$$\begin{array}{r} 2c = -3 \\ \frac{2c}{2} = \frac{-3}{2} \\ \hline \end{array}$$

$$\boxed{c = -\frac{3}{2}}$$

$$\begin{array}{r} c+2=0 \\ -2 \quad -2 \\ \hline \end{array}$$

$$\boxed{c = -2}$$

Example 5

Solve $3m^2 - 11m - 4 = 0$.

$$\underline{(m-4)} \underline{(3m+1)} = 0$$

$$3m^2 \boxed{+m - 12m} - 4$$

$$\begin{array}{r} m-4=0 \\ +4 \quad +4 \\ \hline \end{array}$$

$$\boxed{m=4}$$

$$\begin{array}{r} 3m+1=0 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\begin{array}{r} 3m = -1 \\ \frac{3m}{3} = \frac{-1}{3} \\ \hline \end{array}$$

$$\boxed{m = -\frac{1}{3}}$$