

Name: _____

Date: _____

Learning Goal 1.2Factor trinomials of the form $ax^2 + bx + c$.

Factor the following expression. Expand your answer to check your work.

a. $2x^2 + 15x + 7$

$$\begin{aligned}14 \times 1 &= 2 \times 7 = 14 \\14 + 1 &= 15\end{aligned}$$

$$\begin{aligned}&= 2x^2 + 14x + x + 7 \\&= 2x(x + 7) + (x + 7) \\&= (x + 7)(2x + 1)\end{aligned}$$

b. $2x^2 + 5x + 2$

$$\begin{aligned}4 \times 1 &= 2 \times 2 = 4 \\4 + 1 &= 5\end{aligned}$$

$$\begin{aligned}&= 2x^2 + 4x + x + 2 \\&= 2x(x + 2) + (x + 2) \\&= (x + 2)(2x + 1)\end{aligned}$$

c. $6x^2 + 7x + 2$

$$\begin{aligned}3 \times 4 &= 6 \times 2 = 12 \\3 + 4 &= 7\end{aligned}$$

$$\begin{aligned}&= 6x^2 + 3x + 4x + 2 \\&= 3x(2x + 1) + 2(2x + 1) \\&= (2x + 1)(3x + 2)\end{aligned}$$

d. $8p^2 - 18p - 5$

$$\begin{aligned}(-20) \times 2 &= 8 \times (-5) = -40 \\(-20) + 2 &= -18\end{aligned}$$

$$\begin{aligned}&= 8p^2 - 20p + 2p - 5 \\&= 4p(2p - 5) + (2p - 5) \\&= (2p - 5)(4p + 1)\end{aligned}$$

e. $24h^2 - 20h - 24$

$$\begin{aligned}(-9) \times 4 &= 6 \times (-6) = -36 \\(-9) + 4 &= -5\end{aligned}$$

$$\begin{aligned}&= 4(6h^2 - 9h + 4h - 6) \\&= 4(3h(2h - 3) + 2(2h - 3)) \\&= 4(2h - 3)(3h + 2)\end{aligned}$$

f. $3s^2 - 13s - 10$

$$\begin{aligned}(-15) \times 2 &= 3 \times (-10) = -30 \\(-15) + 2 &= -13\end{aligned}$$

$$\begin{aligned}&= 3s^2 - 15s + 2s - 10 \\&= 3s(s - 5) + 2(s - 5) \\&= (s - 5)(3s + 2)\end{aligned}$$