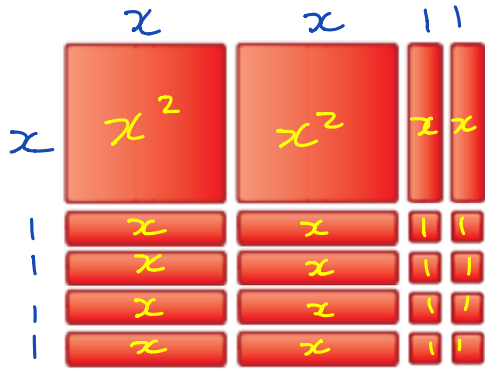


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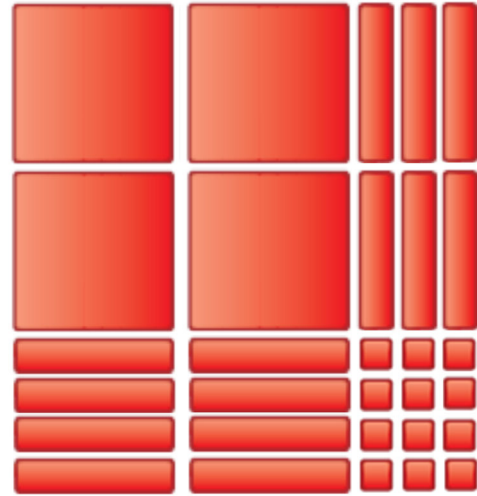
Learning Goal 1.2	Factor trinomials of the form $ax^2 + bx + c$.
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$$= 2x^2 + 10x + 8 = 2(x^2 + 5x + 4)$$

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

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



$$= 4x^2 + 14x + 12$$

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

$$= 2(2x+3)(x+2)$$

But again, you cannot use this model forever.

- 2D
- +ve/-ve

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

a. $2x^2 - 6x - 8$

$$\frac{-8}{-8} \times \frac{2}{+2} = \frac{2x-8}{-6} = -16$$

$$\frac{-8}{-8} + \frac{+2}{+2} = -6$$

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

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

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

$$= 2(x-4)(x+1)$$

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

$$= 2x(x+1) - 8(x+1)$$

$$= (x+1)(2x-8)$$

$$= 2(x+1)(x-4)$$

$$ax^2 + bx + c$$

b. $3x^2 - 4x + 1$

$$\begin{array}{l} \underline{-3} \times \underline{-1} = 3 \times 1 = 3 \\ \underline{-3} + \underline{-1} = -4 \end{array}$$

$$= 3x^2 - 3x - x + 1$$

$$= 3x(x-1) - (x-1)$$

$$= (x-1)(3x-1)$$

d. $4m^2 + 4m - 3$

$$\begin{array}{l} \underline{6} \times \underline{-2} = 4 \times -3 \\ \quad \quad \quad = -12 \\ \underline{6} + \underline{-2} = 4 \end{array}$$

$$= 4m^2 + 6m - 2m - 3$$

$$= 2m(2m+3) - (2m+3)$$

$$= (2m+3)(2m-1)$$

f. $6q^2 - 7q - 3$

$$\begin{array}{l} \underline{-9} \times \underline{2} = 6 \times -3 \\ \quad \quad \quad = -18 \\ \underline{-9} + \underline{2} = -7 \end{array}$$

$$= 6q^2 - 9q + 2q - 3$$

$$= 3q(2q-3) + (2q-3)$$

$$= (2q-3)(3q+1)$$

h. $3m^2 + 10mn - 8n^2$

$$\begin{array}{l} \underline{12} \times \underline{-2} = 3 \times -8 = -24 \\ \underline{12} + \underline{-2} = 10 \end{array}$$

$$= 3m^2 + 12mn - 2mn - 8n^2$$

$$= 3m(m+4n) - 2n(m+4n)$$

$$= (m+4n)(3m-2n)$$

c. $5z^2 + 7z + 2$

$$\begin{array}{l} \underline{5} \times \underline{2} = 5 \times 2 = 10 \\ \underline{5} + \underline{2} = 7 \end{array}$$

$$= 5z^2 + 5z + 2z + 2$$

$$= 5z(z+1) + 2(z+1)$$

$$= (z+1)(5z+2)$$

e. $3a^2 + 26a - 9$

$$\begin{array}{l} \underline{27} \times \underline{-1} = 3 \times -9 \\ \quad \quad \quad = -27 \\ \underline{27} + \underline{-1} = 26 \end{array}$$

$$= 3a^2 + 27a - a - 9$$

$$= 3a(a+9) - (a+9)$$

$$= (a+9)(3a-1)$$

g. $2p^2 + 3p - 9$

$$\begin{array}{l} \underline{6} \times \underline{-3} = 2 \times -9 \\ \quad \quad \quad = -18 \\ \underline{6} + \underline{-3} = 3 \end{array}$$

$$= 2p^2 + 6p - 3p - 9$$

$$= 2p(p+3) - 3(p+3)$$

$$= (p+3)(2p-3)$$

i. $4r^4 + 20r^2t^2 + 25t^4$

$$\begin{array}{l} \underline{10} \times \underline{10} = 4 \times 25 \\ \quad \quad \quad = 100 \\ \underline{10} + \underline{10} = 20 \end{array}$$

$$= 4r^4 + 10r^2t^2 + 10r^2t^2 + 25t^4$$

$$= 2r^2(2r^2+5t^2) + 5t^2(2r^2+5t^2)$$

$$= (2r^2+5t^2)(2r^2+5t^2)$$

$$= (2r^2+5t^2)^2$$