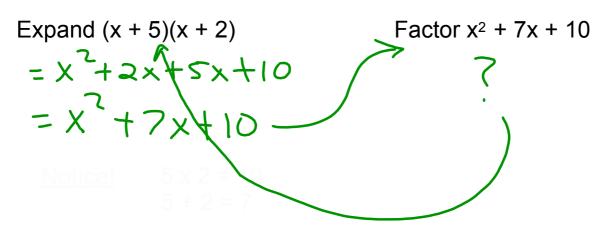
Expanding and Factoring are opposite operations.

Examples

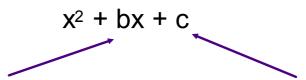


Expand
$$(x + 4)(x + 1)$$

Expand
$$(x + 3)(x + 4)$$

Notice!
$$4 \times 1 = 4$$
 Notice! $3 \times 4 = 12$ $4 + 1 = 5$ $3 + 4 = 7$

When <u>Factoring Trinomials</u>, we need to find...



Two numbers that add together to equal b.

Two numbers that multiply together to equal c.

So that we get:

$$(x + \underline{)}(x + \underline{)})$$

Example 1: Factor each trinomial.

b)
$$x^{2} + 6x + 8$$

$$\frac{2}{2} \times \frac{4}{4} = 8$$

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

$$c(x^{2}) + 3x - 4 \qquad \frac{-4}{-1 \times 4} \qquad d) x^{2} - 3x - 18$$

$$\frac{-1}{-1} \times \frac{4}{4} = -4 \qquad \frac{-6}{-6} \times \frac{3}{3} = -18$$

$$\frac{-6}{-6} \times \frac{3}{3} = -3$$

$$-(x-1)(x+4) \qquad -(x+4) \qquad -$$

d)
$$x^{2} - 3x - 18$$

 $\frac{-6}{-6} \times \frac{3}{3} = -18$
 $\frac{-6}{3} + \frac{3}{3} = -3$

$$= (x-6)(x+3) - \frac{-18}{-9 \times 2}$$

$$-3 \times 6$$

$$-1 \times 18$$

$$1 \times -18$$

$$-6 \times 3$$

$$-2 \times 9$$

Example 2: Find an expression for the rectangle's area by factoring. $A = L \times W$

$$A = x^{2} + 3x - 28$$

$$-28$$

$$-4x - 7$$

$$-4x - 7$$

$$-4x - 7$$

$$-4x - 7$$

$$-38$$

$$-2x - 14$$

$$-$$

Example 3: Factor the following. (**Hint**: You will need to common factor first and then trinomial factor second.)

a)
$$5x^{2} + 35x + 30$$

 $= 5 \left(\frac{5x^{2} + 35x + 30}{5} \right)$

$$= 5 \left(\frac{5x^{2} + 35x + 30}{5} \right)$$

$$= -2 \left(\frac{-2x^{2} + 4x - 2}{-2} \right)$$

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