Factoring Quadratics

Given a quadratic in standard form,

$$ax^2+bx+c$$

If there's a common factor, factor it out

$$2x^2+8x+6$$

$$\downarrow$$

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

Find the factors of c that add to b

$$3 \cdot 1 = 3$$

$$3 + 1 = 4$$

Put the factors into parentheses

$$(x-s)(x-t)$$

$$\downarrow$$

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

Add the common factor

$$2(x-3)(x-1)$$

Example:

$$3x^2 + 24x + 36$$

$$\downarrow$$

$$3(x^2 + 8x + 12)$$

$$\downarrow$$

$$6 + 2 = 8$$

$$6 \cdot 2 = 12$$

$$\downarrow$$

$$(x-6)(x-2)$$

$$\downarrow$$

$$3(x-6)(x-2)$$