

Example: Factorise $2x^2 + 7x + 6$

1) Identify a, b, and c.

$$\begin{array}{ccc} a & b & c \\ 2x^2 & + 7x & + 6 \end{array}$$

2) Multiply ac.

$$2 \times 6 = 12$$

3) Write the factors of ac. Which factor pair adds to make b?

$$\begin{array}{cc} \underline{12} & \\ 1 & 12 \\ 2 & 6 \\ 3 & 4 \end{array} \quad 3 + 4 = 7$$

$$2x^2 + 7x + 6 = 2x^2 + 4x + 3x + 6$$

4) Factorise each pair of terms

$$2x^2 + 4x + 3x + 6 = 2x(x + 2) + 3(x + 2)$$

5) Factorise out the common bracket.

$$\begin{array}{l} 2x(x + 2) + 3(x + 2) \\ 2x(x + 2) + 3(x + 2) \\ (2x + 3)(x + 2) \end{array}$$

a) Factorise $3x^2 + 8x + 4$

1) Identify a, b, and c.

$$\begin{array}{ccc} a & b & c \\ 3x^2 & + 8x & + 4 \end{array}$$

2) Multiply ac.

$$3 \times 4 = 12$$

3) Write the factors of ac. Which factor pair adds to make b?

$$\begin{array}{cc} \underline{12} & \\ 1 & 12 \\ 2 & 6 \\ 3 & 4 \end{array} \quad 2 + 6 = 8$$

$$3x^2 + 8x + 4 = 3x^2 + 2x + 6x + 4$$

4) Factorise each pair of terms

$$3x^2 + 2x + 6x + 4 = x(3x + 2) + 2(3x + 2)$$

5) Factorise out the common bracket.

$$\begin{array}{l} x(3x + 2) + 2(3x + 2) \\ (\quad) (\quad) \end{array}$$

b) Factorise $5x^2 + 12x - 9$

1) Identify a, b, and c.

$$\begin{array}{ccc} a & b & c \\ 5x^2 & + 12x & - 9 \end{array}$$

2) Multiply ac.

$$5 \times -9 = -45$$

3) Write the factors of ac. Which factor pair adds to make b?

$$\begin{array}{ccc} & \underline{-45} & \\ -1 & 45 & 1 & -45 \\ -3 & 15 & 3 & -15 & -3 + 15 = 12 \\ -5 & 9 & 5 & -9 \end{array}$$

$$5x^2 + 12x - 9 =$$

4) Factorise each pair of terms

$$5x^2 + 15x - 3x - 9 = (\quad) + (\quad)$$

5) Factorise out the common bracket

$$\begin{array}{l} (\quad) + (\quad) \\ (\quad) (\quad) \end{array}$$

c) Factorise $2x^2 + 5x - 3$

1) Identify a, b, and c.

$$\begin{array}{ccc} a & b & c \\ 2x^2 + 5x - 3 \end{array}$$

2) Multiply ac.

$$2x \cdot -3 = -6$$

3) Write the factors of ac. Which factor pair adds to make b?

$$\underline{-6}$$

$$2x^2 + 5x - 3 =$$

4) Factorise each pair of terms

$$2x^2 + \underline{\quad}x + \underline{\quad}x - 3 = (\quad) + (\quad)$$

5) Factorise out the common bracket

$$(\quad) + (\quad)$$

$$(\quad)(\quad)$$

d) Factorise $3x^2 + 17x + 20$

1) Identify a, b, and c.

$$\begin{array}{ccc} a & b & c \\ 3x^2 + 17x + 20 \end{array}$$

2) Multiply ac.

3) Write the factors of ac. Which factor pair adds to make b?

$$3x^2 + 17x + 20$$

4) Factorise each pair of terms

$$3x^2 + \quad + 20 = (\quad) + (\quad)$$

5) Factorise out the common bracket

$$(\quad) + (\quad)$$

$$(\quad)(\quad)$$

e) Factorise $3x^2 + 8x - 16$

1) Identify a, b, and c.

2) Multiply ac.

3) Write the factors of ac. Which factor pair adds to make b?

4) Factorise each pair of terms

$$= (\quad) + (\quad)$$

5) Factorise out the common bracket

$$(\quad) + (\quad)$$

$$(\quad)(\quad)$$