Factorizing Equations

Step-by-step method

Step 1 — Find the common factor

Look for the largest number or variable that divides into every term.

Example:

$$8x + 12$$

Both terms can be divided by 4.

Step 2 — Divide each term by the common factor

$$8x \div 4 = 2x$$

$$12 \div 4 = 3$$

Step 3 — Write the factor outside brackets

$$8x + 12 = 4(2x + 3)$$

Example with variable factors

Factorise:

$$12x^2 + 6x$$

Both terms share:

- 6
- x

So the HCF is $6x$.

Divide each term:

$$12x^2 \div 6x = 2x$$

$$6x \div 6x = 1$$

Answer:

$$12x^2 + 6x = 6x(2x + 1)$$

a. $10a + 5b + 15$

b. $3c + 6 - 9d$

c. $8x + 10y - 12z$

d. $x^2 + 2x$

e. $14x^2 - 35x$

f. $16b^2 + 24b$

g. $2ab + 4b^2$

h. $33xy + 44x^2$

i. $20ab - 8b^2$

j. $\underline{9ef} + \underline{3e^2f}$

k. $\underline{4x^2y} + \underline{8x} - \underline{10xy}$

l. $\underline{18a^3} - \underline{27a} + \underline{9a^2}$

m. $\underline{12p^2q} + \underline{14pq^2}$

n. $\frac{4a^2b}{4a^2b} + \frac{8a^2b^2}{4a^2b}$ $4a^2b($ $)$

o. $\frac{9x^3y^2}{3x^2y^2} - \frac{12x^2y^3}{3x^2y^2}$ $3x^2y^2($ $)$

a. $\underline{30x^2} - \underline{45xy} + \underline{60x}$

b. $\frac{15a^3b^2}{5a^2b^2} + \frac{25a^2b^3}{5a^2b^2}$ $5a^2b^2($ $)$

c. $\underline{12p^2qr} + \underline{9p^2q^2r} - \underline{15pqr^2}$

d. $14a^2b^2+7ab^2+49a^2b$

e. $\underline{18c^2d^2e} + \underline{27cd^2e^2} - \underline{9cde}$

f. $4g^4h^2i - 16gh^3i^4 - 40g^2h^3i^5$

g. $x^2 - 9$

h. $x^2 - 49$

i. $x^2 - 81$

j. $\underline{4(x + 2)} - \underline{8(x + 2)^2}$

k. $15(2a - 1)^3 + 25(2a - 1)^2$

l. The area of a rectangle is $(8x2 - 10x)cm^2$. What could length and width be?

m. The area of a rectangle is $(9x^2 - 10xy)cm^2$. What could length and width be?

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