

Rearranging Formulae

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Make x the subject of $y = 4x - 7$.

Step 1 · x was multiplied by 4, then 7 was subtracted. Undo the subtraction first

$$y + 7 = 4x$$

Step 2 · Undo the multiplication

$$x = (y + 7)/4$$

Answer: $x = (y + 7)/4$

Check: $x = 3$ gives $y = 5$; $(5 + 7)/4 = 3$ ✓

2. Now try one with the steps

Make r the subject of $A = \pi r^2$.

Step 1 · Divide both sides by π

Step 2 · Square root both sides

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Make x the subject of $y = x + 9$. [1]

2. Make x the subject of $y = 5x$. [1]

3. Make l the subject of $P = 2l + 2w$. [2]

4. Make a the subject of $v = u + at$. [2]

5. Make r the subject of $C = 2\pi r$. [1]

6. Make x the subject of $y = x/3 + 4$. [2]

7. Make h the subject of $A = \frac{1}{2}bh$. [2]

8. Make v the subject of $E = \frac{1}{2}mv^2$. [3]

9. Make x the subject of $y = \sqrt{x - 2}$. [2]

10. Make L the subject of $T = 2\pi\sqrt{L/g}$. [3]

11. Make C the subject of $F = 9C/5 + 32$. [3]

12. Use your formula from question 11 to convert 212°F into $^\circ\text{C}$. [1]

13. Make x the subject of $ax = bx + c$. [3]

14. Make x the subject of $y = (x + 1)/(x - 2)$. [4]

15. Make p the subject of $3(p + q) = pr$. [4]

4. Before you hand it in

$y = 4x - 7 \rightarrow x = y/4 + 7$

The -7 was done last, so undo it first: $y + 7 = 4x$, then $x = (y + 7)/4$.

$v^2 = u^2 + 2as \rightarrow v = u + \sqrt{2as}$

A square root applies to the whole side: $v = \sqrt{u^2 + 2as}$. $\sqrt{a + b}$ is not $\sqrt{a} + \sqrt{b}$.

$ax = bx + c \rightarrow x = (bx + c)/a$

The answer cannot contain x . Collect: $ax - bx = c$, factorise: $x(a - b) = c$, divide: $x = c/(a - b)$.

$2s = (u + v)t \rightarrow t = 2s/u + v$

Divide by the whole of $(u + v)$ and keep the brackets: $t = 2s/(u + v)$.