

Changing the Subject

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Make x the subject of $y = x + 7$

Step 1 · 7 has been added to x . Undo it: subtract 7 from both sides

$$y - 7 = x$$

Step 2 · Write with the subject on the left

$$x = y - 7$$

Answer: $x = y - 7$

Check: If $x = 3$, $y = 10$. Then $y - 7 = 3$ ✓

2. Now try one with the steps

Make a the subject of $P = 4a$

Step 1 · a has been multiplied by 4. Undo it: divide both sides by 4

Step 2 · Write with the subject on the left

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 m the subject of $d = 5m$ [1]

3. Using $F = 1.8C + 32$, find F when $C = 20$. [1]

4. Make x the subject of $y = x/4$ [1]

5. Make x the subject of $y = 2x + 6$ [2]

6. Make c the subject of $P = a + b + c$ [1]

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

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

9. Make C the subject of $F = 1.8C + 32$ [2]

10. Use $C = (F - 32)/1.8$ to change 50°F into $^{\circ}\text{C}$. [1]

11. Make l the subject of $P = 2(l + w)$ [2]

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

13. Make t the subject of $v = u + at$ [2]

14. A taxi fare is $C = 3 + 2m$ pounds for m miles. Make m the subject, then find m when $C = 19$. [3]

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

4. Before you hand it in

$y = 3x - 5 \rightarrow x = y/3 + 5$

x was multiplied by 3 FIRST and 5 subtracted SECOND, so undo the -5 first: $y + 5 = 3x$, then divide: $x = (y + 5)/3$.

$y = 2x + 6 \rightarrow x = y - 6/2$

The whole of $y - 6$ must be divided: $x = (y - 6)/2$. Use brackets or a fraction line over the whole top.

$y = 5 - x \rightarrow x = y - 5$

Add x to both sides: $y + x = 5$, then subtract y: $x = 5 - y$. Check: $x = 1$ gives $y = 4$, and $5 - 4 = 1$ ✓.

Doing an operation to only one side

Whatever you do to one side you must do to the whole of the other side, just like solving an equation.