Your notes

GCSE Maths: revision notes

Rearranging formulae

Contents

1. Changing the subject
2. More examples
3. Powers and roots
4. Subject appearing twice (Higher)
5. Worked examples
6. Key terms
7. Quick questions
8. What to do next

Changing the subject

- To make a letter the **subject**, get it on its own using **inverse operations**, doing the same to both sides.
- Undo operations in the reverse order: $y = 3x + 2 \rightarrow y - 2 = 3x \rightarrow x = (y - 2)/3$.
- $v = u + at \rightarrow v - u = at \rightarrow t = (v - u)/a$.

More examples

- $P = 2l + 2w \rightarrow l = (P - 2w)/2$.
- $y = x/4 - 1 \rightarrow y + 1 = x/4 \rightarrow x = 4(y + 1)$.
- $E = mc^2 \rightarrow m = E/c^2$. $V = lwh \rightarrow h = V/(lw)$.

Powers and roots

- If the **subject** is squared, square root at the end: $A = \pi r^2 \rightarrow r^2 = A/\pi \rightarrow r = \sqrt{(A/\pi)}$.
- If the **subject** is under a root, square both sides.

Subject appearing twice (Higher)

- Collect the terms containing the **subject** on one side, then **factorise** and divide.
- $ax + 3 = bx + 7 \rightarrow ax - bx = 4 \rightarrow x(a - b) = 4 \rightarrow x = 4/(a - b)$.

Worked examples

Make t the subject of v = u + at

Subtract u from both sides. **v − u = at**

Divide both sides by a. **(v − u) ÷ a = t**

Answer: t = (v − u) ÷ a

© LycoLearn · lycolearn.co.uk · Free GCSE and KS3 revision

(Higher) Make x the subject of y = (x + 2) ÷ (x – 3)

Multiply both sides by (x – 3). **y(x – 3) = x + 2**

Expand the bracket. **xy – 3y = x + 2**

Get the x terms on one side and the rest on the other. **xy – x = 3y + 2**

Factorise x out. **x(y – 1) = 3y + 2**

Divide both sides by (y – 1). **x = (3y + 2) ÷ (y – 1)**

Answer: x = (3y + 2) ÷ (y – 1)

Key terms

Subject	The letter on its own on one side of a formula.
Rearrange	Change a formula so that a different letter is the subject.
Inverse operation	The operation that undoes another, such as subtraction for addition.
Factorise	Take out a common factor, such as x(a – b).

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Make x the subject of y = x + 5.
2. Make x the subject of y = 3x.
3. Make x the subject of y = 3x + 2.
4. Make t the subject of v = u + at.
5. Make l the subject of P = 2l + 2w.
6. Make h the subject of V = lwh.
7. Make x the subject of y = x/4 – 1.
8. Make m the subject of E = mc^2.

Answers

1. x = y – 5
2. x = y/3
3. x = (y – 2)/3
4. t = (v – u)/a
5. l = (P – 2w)/2
6. h = V/(lw)
7. x = 4(y + 1)
8. m = E/c^2

What to do next

Practise 12 questions on this topic

Try 6 exam questions, with mark schemes

Read the lesson, one step at a time

Your notes

Your notes