Your notes

GCSE Maths: revision notes

Functions

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Function notation

- A **function** takes an **input** and gives an **output**. f(x) = 3x + 2 means 'multiply by 3, then add 2'.
- f(4) means substitute x = 4: f(4) = 3 × 4 + 2 = 14.
- To solve f(x) = 20, write 3x + 2 = 20, so x = 6.

Composite functions

- fg(x) means do g first, then f. If f(x) = 3x + 2 and g(x) = x^2, then fg(x) = $3x^2$ + 2 and gf(x) = $(3x + 2)^2$.
- fg(2) = f(g(2)) = f(4) = 14. Usually fg(x) and gf(x) are different.

Inverse functions

- The **inverse function** $f^{-1}(x)$ reverses f. Write y = f(x), make x the subject, then swap back to x.
- For f(x) = 3x + 2: y = 3x + 2, so x = (y – 2)/3, and $f^{-1}(x)$ = (x – 2)/3.
- The inverse undoes the **function**: f(4) = 14 and $f^{-1}(14)$ = 4.

Key terms

Function	A rule that turns each input into exactly one output.
Input	The value that goes into a function.
Output	The value that comes out of a function.
Composite function	Two functions applied one after the other, such as fg(x).
Inverse function	The function that reverses another, written $f^{-1}(x)$.

Quick questions

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

1. $f(x) = 3x + 2$. What is $f(4)$?
2. $f(x) = x^2 - 1$. What is $f(-3)$?
3. $f(x) = 3x + 2$. Solve $f(x) = 20$.
4. $f(x) = 3x + 2$ and $g(x) = x^2$. What is $fg(2)$?
5. $f(x) = 3x + 2$ and $g(x) = x^2$. What is $gf(x)$?
6. What does $fg(x)$ mean?
7. $f(x) = 3x + 2$. What is $f^{-1}(x)$?
8. $f(x) = 2x - 5$. What is $f^{-1}(3)$?

Answers

1. 14
2. 8
3. $x = 6$
4. 14
5. $(3x + 2)^2$
6. Apply g first, then f
7. $(x - 2)/3$
8. 4

What to do next

Practise 12 questions on this topic

Try 5 exam questions, with mark schemes

Read the lesson, one step at a time

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