MATHEMATICS · GRADES 10-12

Evaluating functions

Difficulty level: Advanced

Mathematics: Grades 10-12

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Overview of the concept

This is how you work out what comes out when you put a number into a rule. A phone bill rule takes the gigabytes you used and gives you the total you owe, and changing the input changes the output. Every function is a machine like that, one input in, one output out. Knowing how to run it lets you predict the result before you commit to anything.



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Worked examples

EXAMPLE 1

Q For $f(x) = x^2 - 2x$, find $f(3)$

SOLUTION

Replace every x with 3: $f(3) = 3^2 - 2 \times 3$

Work out $3^2 = 9$ and $2 \times 3 = 6$

Subtract: $9 - 6 = 3$, so $f(3) = 3$

EXAMPLE 2

Q For $f(x) = x^2 - 2x$, find $f(-2)$

SOLUTION

Replace every x with -2: $f(-2) = (-2)^2 - 2 \times (-2)$

Work out $(-2)^2 = 4$ and $2 \times (-2) = -4$

Subtract: $4 - (-4) = 8$, so $f(-2) = 8$

Practice questions

1 $f(x) = x + 7$. What is $f(3)$?

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2 $f(x) = 2x - 1$. What is $f(6)$?

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3 $f(x) = x^2$. What is $f(-4)$?

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4 $f(x) = 3x + 5$. What is $f(-2)$?

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5 $f(x) = x^2 - x$. What is $f(5)$?

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6 $f(x) = 8 - x$. What is $f(10)$?

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7 $f(x) = x^2 + 4$. What is $f(-3)$?

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8 $f(x) = 5x$. What is $f(7)$?

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9 $f(x) = x^2 - 9$. What is $f(4)$?

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10 $f(x) = 2x + 3$. What input gives $f(x) = 9$?

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ANSWER KEY

1. 10

2. 11

3. 16

4. -1

5. 20

6. -2

7. 13

8. 35

9. 7

10. 3

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