MATHEMATICS · GRADES 7-9

Order of operations with variables

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you work out a formula the same way every time, like a phone bill that charges a flat fee plus a rate per gigabyte. A phone company plugs your data use into the same formula each month, and the bill only comes out right if the multiplication happens before the addition. A taxi fare works the same way, with a base charge plus a rate per kilometre. Once you can read a formula in the right order, you can work out any bill, fare, or charge that is built from a flat fee and a rate.



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Rule

Order of operations: you follow BEDMAS.

BEDMAS stands for Brackets, Exponents, Division and Multiplication, Addition and Subtraction. Work through a calculation in that order. Do the brackets first, then the exponents, then division and multiplication from left to right, then addition and subtraction from left to right.

Worked examples

EXAMPLE 1

Q Evaluate $2x^2 + 3$ when $x = 3$

Picture it



SOLUTION

Picture it

Evaluate $2x^2 + 3$ when $x = 3$

Replace x with 3: $2 \times 3^2 + 3$.

Do the power before multiplying: $3^2 = 9$, so $2 \times 9 + 3$.

Multiply then add: $18 + 3 = 21$

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EXAMPLE 2

Q Evaluate 4(x + 2) when x = 5

Picture it

Evaluate 4(x + 2) when x	=	5

SOLUTION

Picture it

Evaluate 4(x + 2) when x = 5

Replace x with 5: 4 × (5 + 2).

Do the brackets first: 5 + 2 = 7, so 4 × 7.

Multiply: 4 × 7 = 28

Practice questions

1 Evaluate 2x + 1 when x = 6

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2 **Evaluate x^2 when $x = 7$**

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3 **Work out $3(x - 2)$ when $x = 9$**

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4 **Work out $5 + 2 \times 4$.**

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5 **Work out $2x^2$ when $x = 4$**

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6 **Work out $(x + 1)^2$ when $x = 3$**

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7 **Work out $10 - x^2$ when $x = 3$**

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8 **Work out $4x \div 2$ when $x = 8$**

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9 **Work out $x^2 + x$ when $x = 5$**

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10 **Work out $3x - 2$ when $x = 0$**

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ANSWER KEY

1. 13

2. 49

3. 21

4. 13

5. 32

6. 16

7. 1

8. 16

9. 30

10. -2

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