MATHEMATICS · GRADES 7-9

Variables and constants

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you tell what can change from what stays fixed in a formula, like the number of items you buy versus the price of each one, so you can read any rule correctly. A variable is a value that can change, while a constant stays the same every time you use the formula. Knowing which is which tells you what you are solving for, and what you can treat as a fixed number. That is how you read a taxi fare, a recipe, or any rule, and know what varies and what does not.



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Worked examples

EXAMPLE 1

Q Identify the variables, constants and coefficients in $3x + 7y - 5$.

SOLUTION

This is a variables and constants question, so the one rule to remember is: a variable is a letter that can stand for different values, a constant is a plain number that never changes, and a coefficient is the number multiplied by a variable. Sort each piece by which job it does.

The letters are x and y, so they are the variables, and –5 has no letter, so it is the constant.

The number in front of x is 3 and the number in front of y is 7, so the coefficients are 3 and 7.

EXAMPLE 2

Q A taxi ride costs $3 plus $2 per kilometre. Write a cost expression in terms of k kilometres and identify the constant.

SOLUTION

This is the same question type with a real story: the part that stays the same every ride is the constant, and the part that depends on the trip is the variable.

The cost is 3 + 2k, where k is the number of kilometres.

The constant is 3, because the $3 is charged no matter how far you go, and the 2k changes with the trip.

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Practice questions

1 In the expression $5x + 7$, what is the variable?

- **A** x
- **B** 5
- **C** 7
- **D** 5x + 7

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2 In the expression $3a - 8$, what is the constant?

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3 In the expression $2x^2 + 5z + 3$, what are the variables?

- **A** x, z
- **B** x
- **C** z
- **D** 2x, 5z

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4 In the expression $4a^2b - 9c + 2$, what is the constant?

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5 **Which of these quantities changes: the number of days in a week, or the electric bill each month?**

- **A** The number of days in a week
- **B** The electric bill each month

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6 **A plumber charges $40 to visit, plus $60 for each hour of work. Which part is the constant?**

- **A** The $40 visit charge
- **B** The $60 per hour
- **C** The number of hours
- **D** The total cost

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7 True or false: in $7x + 1$, the constant is 7

A True

B False

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8 In the expression $5a - 3b + 2c - a + 7$, how many terms (the parts joined by + or −) contain the variable a?

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9 **Chocolate costs $2 per bar. You buy n bars. Write a cost expression using n, then say which part is the variable and whether there is a constant term.**

- **A** 2n, variable n, no constant term
- **B** 2n, variable 2, constant n
- **C** n + 2, variable n, constant 2
- **D** 2 + n, variable 2, no constant term

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10 **In the expression $5x + 4y - 9$, what is the coefficient of y?**

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ANSWER KEY

1. x

2. -8

3. x, z

4. 2

5. The electric bill each month

6. The $40 visit charge

7. False

8. 2

9. 2n, variable n, no constant term

10. 4

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