MATHEMATICS · GRADES 7-9

Word problems using equations

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you turn a story into an equation and solve it, like working out how many hours you need to work to afford something, so you answer the story and not just the sum. The story gives you the facts, and the equation is those facts written in maths, with the unknown standing for what you want to find. Solving the equation gives you a number, but the job is not done until you say what that number means in the story. That is how you turn a real question into maths, and turn the maths answer back into a real answer.



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Worked examples

EXAMPLE 1

Q At the fair, admission is $5 and each ride costs $2. Ian spent $35 in total. How many rides did he take?

SOLUTION

This is a word problem that needs an equation, so the one rule to remember is: turn the story into an equation first, with a letter for the unknown, then solve the equation like any two-step equation. The fixed part is the admission, and the rides are the part that changes.

Let t be the number of rides: 5 + 2t = 35.

Take 5 from both sides: 2t = 30, so t = 15 rides

EXAMPLE 2

Q Three friends each buy a ticket and $4 of popcorn, and together they spend $39. What is the price of one ticket?

SOLUTION

This is the same question type with a group instead of one person: the three friends each pay the same amount, so put the whole per-person amount in brackets before multiplying by 3.

Let t be the price of one ticket: 3(t + 4) = 39.

Divide both sides by 3: t + 4 = 13, so t = 9, and one ticket costs $9.

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Practice questions

1 A shop sells 8 books for a total of $136. Let b be the price of one book. Which equation and price are correct?

- **A** 8b = 136, b = $15
- **B** 8b = 136, b = $16
- **C** 8b = 136, b = $17
- **D** 8b = 136, b = $18

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2 There are 331 students on a field trip. They travel on 6 buses with the same number of students each, and 7 more students travel by car. How many students are on each bus?

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3 A gym membership costs $50 to join plus $20 per month. A member has paid $290 in total. For how many months has she been a member?

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4 Scott charges $35 per car wash plus $7 per hour for detailing. A bill is $63. How many hours of detailing did the customer get?

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5 Jill sold half of her comic books, and then sold 16 more. She now has 36 comics left. How many comics did Jill have at the start?

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6 Diego adds 6 to a number, then multiplies the result by 5 and gets 55. What is the number?

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7 The length of a rectangle is $2w - 3$, where w is its width. The length is 9 metres. What is the width?

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8 Nick's dog weighs 12 pounds more than Kiyah's dog, which weighs 60 pounds. Which equation gives the weight n of Nick's dog?

A. $n - 12 = 60$

B. $n = 60 + 12$

C. $60 + n = 12$

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9 A number is added to 7, then multiplied by 3 to get 48. Find the number, by first writing the equation and then solving it.

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10 Jamal has $45 saved. He saves $8 each week. After how many weeks will he have $93?

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ANSWER KEY

1. 8b = 136, b = $17

2. 54

3. 12

4. 4

5. 104

6. 5

7. 6

8. n = 60 + 12

9. 9

10. 6

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