MATHEMATICS · GRADES 7-9

Equations with decimals

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you solve for an unknown when the numbers have decimals. Money is the obvious case, like working out how many hours you need to work to afford something after tax. Decimals do not change the method, they just need careful place value so the answer is not off by a factor of ten. It is the same solving you already know, applied to the numbers real life actually uses.



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Worked examples

EXAMPLE 1

Q Solve $0.5x + 2 = 7$.

SOLUTION

This is a two-step equation with a decimal coefficient. Undo the + 2 first.

$0.5x = 7 - 2 = 5$

Divide by 0.5: $x = 5 \div 0.5 = 10$

EXAMPLE 2

Q Solve $1.2x = 12$.

SOLUTION

This is a one-step equation: x is multiplied by 1.2, so divide both sides by 1.2.

$x = 12 \div 1.2 = 10$

Check: $1.2 \times 10 = 12$

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Practice questions

1 Solve $0.5x = 8$

- **A** $x = 4$
- **B** $x = 8$
- **C** $x = 16$
- **D** $x = 24$

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2 Solve $0.2x + 1 = 5$

- **A** $x = 4$
- **B** $x = 10$
- **C** $x = 20$
- **D** $x = 25$

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3 Solve $x \div 0.5 = 6$

- **A** $x = 3$
- **B** $x = 12$
- **C** $x = 6$
- **D** $x = 0.3$

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4 Solve $0.8(x - 2) = 4$

- **A** $x = 5$
- **B** $x = 6$
- **C** $x = 7$
- **D** $x = 8$

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5 Solve $0.6x + 0.4x = 10$

- **A** $x = 5$
- **B** $x = 10$
- **C** $x = 20$
- **D** $x = 25$

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6 A taxi charges $0.50 per kilometre. A ride costs $12. How many kilometres was the ride?

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7 The solution is $x = 30$. Which equation has this solution?

- **A** $0.5x = 15$
- **B** $0.5x = 30$
- **C** $1.5x = 30$

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8 Ria solves $0.4x = 12$ by working out $12 \div 4 = 3$. What is Ria's mistake?

- **A** She added 4 instead of dividing; $x = 16$
- **B** She divided 4 by 12; $x = 0.33$
- **C** She multiplied by 4; $x = 48$
- **D** She divided by 4, not 0.4; $x = 30$

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9 Solve $0.3x + 0.6 = 1.5$

- **A** $x = 1$
- **B** $x = 3$
- **C** $x = 5$
- **D** $x = 7$

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10 Which one has a different solution from the others?

- **A** $0.5x = 10$
- **B** $0.2x = 4$
- **C** $1.5x = 30$
- **D** $0.4x = 12$

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ANSWER KEY

1. x = 16

2. x = 20

3. x = 3

4. x = 7

5. x = 10

6. 24 km

7. 0.5x = 15

8. She divided by 4, not 0.4; x = 30

9. x = 3

10. 0.4x = 12

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