

WA8MNALE1

Linear and non-linear equations and inequalities

Core + Challenge

Writing and Solving Equations from Word Problems

I can define a variable, write an equation from a worded problem, solve it and check the answer makes sense in context.

Name: _____ Date: _____ Score: _____ / 58

Key idea

Define the variable (let $n = \dots$), **write** an equation from the words, **solve** it, then **answer** the question in a sentence with units.

Consecutive numbers: $n, n + 1, n + 2$. Consecutive even or odd numbers: $n, n + 2, n + 4$. Sum of three consecutive numbers is 84: $3n + 3 = 84 \rightarrow n = 27$.

Ages: if Tom is t now, in 5 years he is $t + 5$, and 3 years ago he was $t - 3$. Mum, 3 times as old, is $3t$ now.

Check in context: does the answer fit the original words? Lengths must be positive; people, coins and trips must be whole numbers.

A Fluency *practise the skill*

/ 16 marks

Q1–7: write an expression. Q8–16: find the unknown number. 1 mark each.

- | | |
|---|--|
| 1. Five more than n _____ | 9. Half of n is 13. $n = ?$ _____ |
| 2. Triple n , then subtract 4 _____ | 10. 3 consecutive numbers sum to 33. Smallest? _____ |
| 3. The number after n _____ | 11. 2 consecutive numbers sum to 45. Larger? _____ |
| 4. n plus the next number _____ | 12. Rectangle: $l = w + 3, P = 26$. $w = ?$ _____ |
| 5. Tom's age in 6 years (now t) _____ | 13. $\$30 + \$5$ per week = $\$85$. Weeks? _____ |
| 6. k kg at $\$4/\text{kg}$ plus a $\$3$ bag _____ | 14. Taxi $\$4 + \$2$ per km = $\$24$. km? _____ |
| 7. Perimeter of a square, side s _____ | 15. Mum is $3 \times$ Sam's age; sum 48. Sam? _____ |
| 8. Double n plus 7 is 19. $n = ?$ _____ | 16. 2 consecutive even numbers sum to 50. Smaller? _____ |

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B**Core** *apply the skill to problems*

/ 22 marks

- 1 Three consecutive whole numbers add to 138. Write an equation and find the numbers. [2 marks]

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Answer: _____

- 2 A Perth taxi charges \$4.80 flagfall plus \$1.90 per km. A trip cost \$36.15. Write and solve an equation to find the length of the trip. [2 marks]

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Answer: _____

- 3 Phone plan A costs \$20 per month plus \$3 per GB of data. Plan B costs \$44 per month plus \$1 per GB. For how many GB do the plans cost the same? Check your answer. [3 marks]

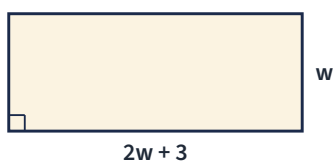
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Answer: _____

- 4 A garden bed is a rectangle. Its length is 3 m more than twice its width, and its perimeter is 45 m. Find its length and width. [3 marks]



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Answer: _____

- 5 Lily is 4 years older than her brother Max. In 3 years, their ages will add to 30. How old are they now? [2 marks]

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Answer: _____

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- 6 Three consecutive odd numbers add to 111. Find them.

[2 marks]

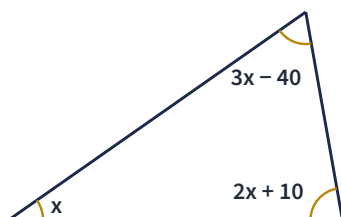
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Answer:

- 7 The angles of a triangle add to 180° . Find x and the size of each angle.

[2 marks]



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Answer:

- 8 Ava loads \$50 onto her SmartRider. Each trip costs \$3.20. After how many trips will she have \$5.20 left?

[2 marks]

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Answer:

- 9 A group hires bikes on Rottnest for \$32 each plus a \$20 booking fee. The total cost is \$276. How many bikes did they hire?

[2 marks]

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Answer:

- 10 In AFL a goal is worth 6 points and a behind 1 point. The Eagles kicked 4 more behinds than goals and scored 88 points. How many goals did they kick?

[2 marks]

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Answer:

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C

Reasoning *explain, justify and check*

/ 9 marks

- 1 Explain why three consecutive whole numbers can never add to 100. [2 marks]

- 2 Jo has \$x. Kim has \$12 more than twice Jo's amount. Together they have \$87. Priya wrote $2(x + 12) + x = 87$. Explain her mistake, then find how much Jo has. [3 marks]

- 3 A student solves a problem about the width of a room and gets $w = -3$. What should they conclude? Explain. [2 marks]

- 4 Write a word problem that the equation $5n + 12 = 47$ could represent. Then solve it. [2 marks]

D

Challenge *multi-step and problem-solving*

/ 11 marks

- 1 A father is 32 years older than his daughter. In 4 years he will be 3 times as old as she will be. How old is each now? [3 marks]

Answer: _____

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- 2 Five consecutive whole numbers are written in order. The sum of the first three equals the sum of the last two. Find the numbers. [3 marks]

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Answer: _____

- 3 Taxi A charges \$4.20 plus \$1.80 per km. Taxi B charges \$6.00 plus \$1.60 per km. (a) For what distance do they cost the same? (b) Which is cheaper for a 12 km trip, and by how much? [3 marks]

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Answer: _____

- 4 A jar holds only 20c and 50c coins: 40 coins worth \$14.30 altogether. How many of each coin are there? [2 marks]

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Answer: _____

How did I go?

Fluency ____ / 16 Core ____ / 22 Reasoning ____ / 9 Challenge ____ / 11 **Total ____ / 58**

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