

WA8MNAUN3

Understanding number

Core + Challenge

Multiplying and Dividing Integers

I can multiply and divide positive and negative integers, explain the sign rules and use them with powers and in contexts.

Name: _____ Date: _____ Score: _____ / 58

Key idea

Same signs → positive: $(+) \times (+) = +$ and $(-) \times (-) = +$. $-6 \times -4 = 24$, $-24 \div -6 = 4$.

Different signs → negative: $(+) \times (-) = -$ and $(-) \times (+) = -$. $7 \times -3 = -21$, $-35 \div 5 = -7$.

Why? $3 \times -2 = -6$, $2 \times -2 = -4$, $1 \times -2 = -2$, $0 \times -2 = 0$: the answers go up by 2 each time, so $-1 \times -2 = 2$ and $-2 \times -2 = 4$.

Several negatives: count them. An even number of negative factors gives +, an odd number gives -. $(-2)^3 = -2 \times -2 \times -2 = -8$, $(-2)^4 = 16$, but $-2^4 = -16$.

A Fluency *practise the skill*

/ 16 marks

Work out each answer. 1 mark each.

1. -7×6 _____

9. $(-3)^2$ _____

2. -8×-5 _____

10. $(-2)^3$ _____

3. 9×-4 _____

11. -3^2 _____

4. $-48 \div 6$ _____

12. $(-1)^{10}$ _____

5. $-56 \div -7$ _____

13. $-2 \times 3 \times -5$ _____

6. $63 \div -9$ _____

14. $-100 \div -4$ _____

7. -12×-3 _____

15. Find n: $n \times -7 = 42$ _____

8. $-1 \times -1 \times -1$ _____

16. Find n: $-72 \div n = 8$ _____

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

/ 22 marks

- 1 Complete the pattern in the table. Describe how the answers change, and use it to explain why $-2 \times -4 = 8$. [2 marks]

Calculation	3×-4	2×-4	1×-4	0×-4	-1×-4	-2×-4
Answer	-12					

Answer: _____

- 2 On a winter night in Collie the temperature was 4°C at 8 pm. It then fell by 3°C every hour for 5 hours. Write the total change as a multiplication of integers, and find the temperature at 1 am. [2 marks]

Answer: _____

- 3 Four friends share a debt of \$84 equally. Write the debt as a negative integer and find each person's share using division. [2 marks]

Answer: _____

- 4 A diver is descending at 12 m per minute (a change of -12 m each minute). Where was the diver 3 minutes ago, compared with now? Write this as a multiplication. [2 marks]

Answer: _____

- 5 Evaluate (a) $-2 \times -3 \times -4$ (b) $(-1)^7 \times (-5)^2$ [2 marks]

Answer: _____

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- 6 Complete the multiplication grid.

[3 marks]

×	-2	6	-7
-3			
4			
-5			

- 7 A café made the same loss of \$1 800 every month for a year. Another café lost \$7 200 in total over 6 months. Use integers to find (a) the first café's total change for the year (b) the second café's average change per month.

[2 marks]

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Answer: _____

- 8 Find the missing numbers: $-8 \times \square = 56$ $\square \div -6 = -9$ $-90 \div \square = 15$

[3 marks]

.....

Answer: _____

- 9 Find two integers with a product of -36 and a sum of 5 .

[2 marks]

.....

Answer: _____

- 10 The minimum temperatures in Katanning over four days were -4°C , -7°C , 2°C and -3°C . Find the mean minimum temperature.

[2 marks]

.....

Answer: _____

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C**Reasoning** *explain, justify and check*

/ 9 marks

- 1 Use the distributive law and the fact that $-3 \times 0 = 0$ to explain why $-3 \times -4 = 12$. (Hint: $0 = 4 + (-4)$.) [3 marks]

- 2 Spot the error: Tom writes $-2^4 = 16$. Explain his mistake and give the correct value. What would he need to write to get 16? [2 marks]

- 3 True or false: the product of 25 negative numbers is negative. Give a reason. [2 marks]

- 4 Use a multiplication fact to explain why $-30 \div -5$ is positive. [2 marks]

D**Challenge** *multi-step and problem-solving*

/ 11 marks

- 1 Evaluate $(-1) \times (-2) \times (-3) \times \dots \times (-10) \div (1 \times 2 \times 3 \times \dots \times 8)$. [2 marks]

Answer: _____

- 2 Three different integers have a product of -30 and a sum of 0 . Find both possible sets of three integers. [3 marks]

Answer: _____

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- 3 Find the value of (a) $(-1) + (-1)^2 + (-1)^3 + \dots + (-1)^{99}$ (b) $(-1) \times (-1)^2 \times (-1)^3 \times \dots \times (-1)^{10}$ [3 marks]

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Answer:

- 4 In a maths competition, a correct answer scores +5, a wrong answer scores -2. Mia answered all 20 questions and scored 51. How many did she get wrong? [3 marks]

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Answer:

How did I go?

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

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