

WA8MNAC3

Calculating with number

Core + Challenge

Operations with Positive and Negative Fractions and Decimals

I can add, subtract, multiply and divide positive and negative fractions and decimals, including powers, and check by estimating.

Name: _____ Date: _____ Score: _____ / 58

Key idea

Same sign rules as integers: same signs $\rightarrow +$, different signs $\rightarrow -$. $-\frac{2}{3} \times \frac{3}{4} = -\frac{1}{2}$ $-0.6 \div -0.2 = 3$

Adding and subtracting fractions: use a common denominator first. $-\frac{1}{2} + \frac{1}{3} = -\frac{3}{6} + \frac{2}{6} = -\frac{1}{6}$. $-1.5 - 2.25 = -3.75$

Index form: $(-\frac{1}{2})^2 = -\frac{1}{2} \times -\frac{1}{2} = \frac{1}{4}$ $(-0.3)^3 = -0.027$ (odd power $\rightarrow$ negative) but $-0.5^2 = -0.25$ (only 0.5 is squared).

Estimate to check: $-4.9 \times 3.1 \approx -5 \times 3 = -15$, so the exact answer -15.19 is reasonable (right sign and about the right size).

A Fluency *practise the skill*

/ 16 marks

Work out each answer. 1 mark each.

1. $-\frac{1}{2} + \frac{3}{4}$ _____

9. $(-\frac{2}{3})^3$ _____

2. $-\frac{2}{3} - \frac{1}{6}$ _____

10. $-2.4 + 5.1$ _____

3. $\frac{3}{5} - \frac{9}{10}$ _____

11. $-3.6 - 1.75$ _____

4. $-\frac{2}{3} \times \frac{9}{10}$ _____

12. -0.4×0.6 _____

5. $-\frac{3}{4} \times -\frac{8}{9}$ _____

13. -1.2×-0.5 _____

6. $-\frac{5}{6} \div \frac{1}{3}$ _____

14. $-4.8 \div 0.6$ _____

7. $-\frac{4}{7} \div -\frac{2}{7}$ _____

15. $(-0.2)^3$ _____

8. $(-\frac{1}{2})^2$ _____

16. Estimate: -5.97×4.02 _____

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B

Core *apply the skill to problems*

/ 22 marks

- 1 At 5 am the temperature in Narrogin was -1.4°C . By noon it had risen by 6.75°C . What was the temperature at noon? [2 marks]

Answer: _____

- 2 A share price changed by $-\$0.35$ every day for 6 days, then rose by $\$1.20$ on the seventh day. Find (a) the change over the first 6 days (b) the overall change after 7 days. [2 marks]

Answer: _____

- 3 The water level in a rainwater tank changes by $-\frac{3}{8}$ m each week during summer. Find the change in level after $2\frac{2}{3}$ weeks. [2 marks]

Answer: _____

- 4 Evaluate $(-\frac{3}{4})^2 - \frac{1}{2}$. [2 marks]

Answer: _____

- 5 First estimate, then calculate exactly: -19.8×0.49 . [3 marks]

Answer: _____

- 6 Sian works out $-6.4 \div -0.8$ and gets -80 . Use estimation to explain her two errors, and give the correct answer. [2 marks]

Answer: _____

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- 7 Evaluate $-\frac{2}{5} + \frac{3}{4} \times -\frac{2}{3}$. [2 marks]

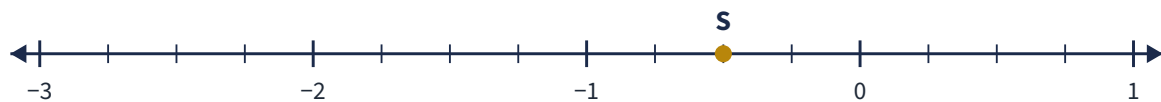
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Answer: _____

- 8 Start at S on the number line. Make 3 jumps of $-\frac{3}{4}$. Where do you land? Write the answer as a mixed number. [2 marks]



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Answer: _____

- 9 A diver at -12.6 m (12.6 m below the surface) rises at 0.45 m per second. How long does it take to reach -3.6 m? [3 marks]

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Answer: _____

- 10 The table shows the minimum temperatures in Bridgetown for five days. Find the mean minimum temperature. [2 marks]

Day	Mon	Tue	Wed	Thu	Fri
Minimum	-2.3°C	1.5°C	-0.8°C	-4.1°C	0.7°C

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Answer: _____

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C

Reasoning *explain, justify and check*

/ 9 marks

- 1 Explain why $(-0.5)^2$ and -0.5^2 have different values. Give both values. [2 marks]

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- 2 True or false: dividing a negative number by a number between 0 and 1 gives a smaller (more negative) answer. Give an example. [2 marks]

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- 3 Leo wrote $-\frac{3}{4} + \frac{1}{2} = -\frac{2}{6}$. Explain his error and find the correct answer. [2 marks]

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- 4 Without working out exact answers, decide which is larger: -0.98×-3.05 or $-2.9 \div -0.99$. Explain using estimation. [3 marks]

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D

Challenge *multi-step and problem-solving*

/ 11 marks

- 1 Evaluate $[(-\frac{1}{2})^3 + \frac{3}{4}] \div (-\frac{5}{8})$. [2 marks]

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Answer: _____

- 2 Find the exact value of $(-1 + \frac{1}{2}) \times (-1 + \frac{1}{3}) \times (-1 + \frac{1}{4}) \times \dots \times (-1 + \frac{1}{10})$. [3 marks]

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Answer: _____

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- 3 Ava thinks of a number. She multiplies it by $-\frac{2}{3}$, adds 1.5, then squares the result. Her final answer is 0.25. Find both possible starting numbers. [3 marks]

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Answer: _____

- 4 Jin calculated $(-3.9)^2 \times -0.52 \div 1.95$ and got -40.56. Estimate the answer to show that Jin is wrong, then find the exact answer. [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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