Choosing efficient exact/decimal representations

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Write $\frac{3}{8}$ as an exact decimal. [2 marks]

$\frac{3}{8} = \frac{375}{1000} = 0.375$.

Answer: 0.375

2. Round $\frac{1}{3}$ to two decimal places and use the correct equality or approximation symbol. [2 marks]

The decimal 0.333… continues beyond two places.

Answer: $\frac{1}{3} \approx 0.33$.

3. Find the exact total of three one-third-metre pieces. Explain why adding three rounded lengths of 0.33 m gives a different result. [3 marks]

$3 \times \frac{1}{3} = 1$.

Three rounded copies lose a total of 0.01 m.

Answer: 1 m; early rounding gives 0.99 m.

4. The square root of 18 is approximately 4.24. Which expression gives its exact value: $\sqrt{18}$ or 4.24? Explain. [2 marks]

Eighteen is not a perfect square, so the exact root is irrational.

Answer: $\sqrt{18}$ gives the exact root; 4.24 is a rounded approximation to it.

5. Four students share AUD 9 equally. Find each share and decide whether cents require rounding. [2 marks]

$9 \div 4 = 2.25$.

This terminates exactly at two decimal places.

Answer: AUD 2.25 each; no rounding is needed.

6. Use $\pi \approx 3.14159$ to round 5π cm to one decimal place. [2 marks]

$5 \times 3.14159 = 15.70795$.

The hundredths digit is 0, so the tenths value remains 15.7.

Answer: 15.7 cm