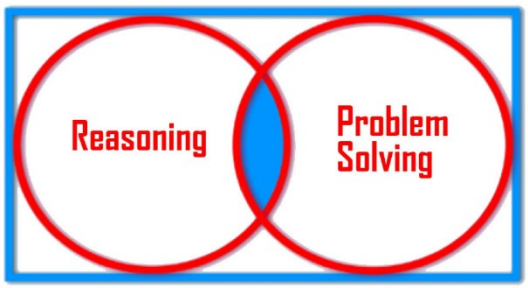
GCSE Foundation (5 – 1)



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Mathematical Reasoning Questions

(Decimals, Rounding and Estimation) – Set 1

Solutions

The questions are repeated here for your convenience

1

When $\frac{2}{3}$ is rounded to 3 decimal places, what digit will be in the third decimal place? Choose one answer

a) 6
b) 3
c) 2
d) 7

Solution

$\frac{2}{3} = 0.\dot{6}$

Therefore, the third decimal place will be a 7

Correct Answer: D **[1mark]**

2

Which calculation below will give an answer of 1.011

Choose all the correct answers

a) $1.0 + 0.01 + 0.0011$
b) $1.0 + 0.01 + 0.001$
c) $0.01 \times 1 + 1 + 0.001$
d) $1.00 + 0.1 + 0.011$

Solution

Correct Answers: B and C **[2marks]**

3

Arrange the following numbers in order of size.

Start with the smallest

$$3.2, \quad \sqrt{6}, \quad 2.05, \quad \sqrt{25}, \quad \frac{12}{8}$$

Solution

$\sqrt{6}$ is in between $\sqrt{4} = 2$ and $\sqrt{9} = 3$

Therefore $\sqrt{6} \approx 2.5$ **[1mark]**

$\sqrt{25} = 5$

$\frac{12}{8} = 1.5$ **[1mark]**

Correct Order: $\frac{12}{8}$, 2.05, $\sqrt{6}$, 3.2, $\sqrt{25}$ **[1mark]**

4 Use the signs $=,\ >,\ <$ to make the following statements correct

Solution

a) 0.5^2 $\boxed{<}$ 2.5

$0.5^2 = 0.25$ **[1mark]**

b) 1.45 $\boxed{=}$ 145% **[1mark]**

c) $\frac{1}{3}$ $\boxed{>}$ 0.3 **[1mark]**

$\frac{1}{3} = 0.\dot{3}$

d) $0.3 + 0.65$ $\boxed{>}$ 0.3×0.65 **[2marks]**

$0.3 + 0.65 = 0.95$

$0.3 \times 0.65 = 0.195$

5 Which of the following will give a better estimate for the calculation below?

48% of 0.7165 kg

a) 40% of 0.7 kg
b) 50% of 1 kg
c) 50% of 0.7 kg
d) 50% of 0.8 kg

Solution

$48\% = 50\%$ to (1sf)

$0.7165 = 0.7$ to (1sf)

Correct Answer: C **[1mark]**

6	A lift is designed to carry a maximum weight of 450kg The mean weight of 6 people in the lift is 69.85kg Estimate the maximum weight of a 7th person in order not to overload the lift. **Solution** $69.85 = 70$ (1sf) **[1mark]** Therefore, the 6 people will weight approximately $70 \times 6 = 420$ kg **[1mark]** Hence the 7th person should weigh no more than 450 – 420 = 30 kg **[1mark]**
7	The estimated cost to restore a medieval relic is £37.83 per cm^2 Two of the relics have a total area of 57 cm^2 Estimate the cost of restoring both relics. **Solution** Estimated area of the two relics = 120 square centimeters (2sf) **[1mark]** Estimated cost per square centimeter = £40 to (1sf) **[1mark]** Estimated total cost = $40 \times 120 = £4800$ **[1mark]**
8	Answer **True** or **False** to the following statements **Solution** a) $\frac{1}{3} = 0.3$ (1dp) $\frac{\mathbf{1}}{\mathbf{3}} = 0.\dot{3}$ therefore **False** **[1mark]** b) $0.9876 = 1.0$ (1dp) **True** **[1mark]** c) $\frac{2}{3} > 0.678$, $\frac{2}{3} = 0.\dot{6}$ Therefore, **False** **[1mark]** d) $13.5\% < \frac{1}{4}$ of 50% $\frac{1}{4}$ of $50\% = 12.5\%$ Therefore, **False [1mark]**

9 Decide whether each calculation below is an underestimate or an overestimate

Solution

a) The length of a football pitch ≈ 1000 m **Overestimate** **[1mark]**

b) $\frac{58.5\times2.991}{4.545} \approx \frac{60\times2}{5} \approx 24$ **Underestimate** **[1mark]**

c) 37.5% of $\frac{1}{5}$ of 57 kg ≈ 40% of 20% of 60 kg **Overestimate** **[1mark]**

10 The fraction $\frac{104}{333} = 0.\dot{3}1\dot{2}$

If the decimal had 24 digits, how many times will it repeat?

Solution

$24 \div 3 = 8$ **[1mark]**

The decimal will repeat 8 times