GCSE Foundation (5 – 1)
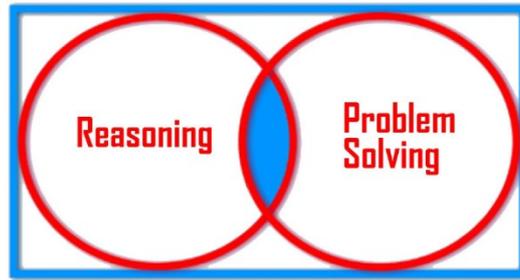

Mathematical Reasoning Questions

(Percentages) – Set 1

Solutions

The questions are repeated here for your convenience

1	Rudolf wants to increase 78kg by 15%.
	Which of the following will give the correct answer?
	Choose all the correct answers.
	    a) $15\% \times 78$
	    b) 1.15×78
	    c) $15\% \times 78 + 78$
	    d) $0.15 \times 78 + 78$
	 <u>Solution</u> Correct Answers: B, C and D
	 [2marks]

2	Irena is going to find 20% of £250. She writes: 10% of £250 $= 250 \div 10$ Therefore 20% of £250 $= 250 \div 20$ Explain why Irena's calculation for 20% is wrong. **<u>Solution</u>** $10\% = \frac{1}{10}$ but $20\% = \frac{1}{5}$ Therefore, Irena could divide 250 by 5 instead. **[1mark]**

3	Answer **True** or **False** to the following statements
	    a) $33\frac{1}{3}\% = \frac{1}{3}$ Therefore, **True** **[1mark]**
	
	    b) $\frac{2}{5}$ of 50m $= \frac{2}{5}\%$ of 50m
	$\frac{2}{5} = 40\%$ Therefore, **False** **[1mark]**
	
	    c) 20% of $\frac{1}{4} = 0.2 \times 0.4$
	$\frac{1}{4} = 25\%$ Therefore, **False** **[1mark]**

4 Write down a single calculation which represents

30% of 30% of $\frac{1}{2}$ of £280

Solution

$0.3 \times 0.3 \times 0.5 \times 280$

OR

$\frac{3}{10} \times \frac{3}{10} \times \frac{1}{2} \times 280$

[1mark]

5 A house costs £180,000.

During 2016, the value of the house increased by 8%

During 2017, the value of the house fell by 2%

Choose the single calculation which gives the current value of the house at the end of 2017

    a) $8\% \times 2\% \times 180,000$

    b) $0.8 \times 0.2 \times 180,000$

    c) $1.8 \times 0.98 \times 180,000$

    d) $1.08 \times 0.98 \times 180,000$

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

6 The sides of a rectangle are increased by 10%.

By what percentage will the area increase?

Choose one answer

    a) 20%

    b) 40%

    c) 21%

    d) 10%

Solution

A 10% increase means a multiplier of 1.1

Therefore, the area will increase by a factor of $1.1 \times 1.1 = 1.21$

Area will increase by 21%

Correct Answer: C **[2marks]**

7	During the first week of birth, the weight of a calf increased by 22% to 55kg. Find the birth weight of the calf. **<u>Here is Crystal's Answer</u>** 20% of 55 = 11kg 2% of 55 = 1.1kg Therefore, the birth weight of the calf is $11 + 1.1 = 12.1$kg Is crystal's answer correct? Explain your answer. **<u>Solution</u>** Crystal worked out 22% of the current weight not of the birth weight. Therefore, Crystal is wrong. If 12.1kg increased by 22% you will get a result less than 55kg **[1mark]**
8	In **Question 7** above, show the correct calculation **<u>Solution</u>** $55 \div 1.22 = 45.08$kg(2dp) **[2marks]**
9	A new car cost £25000. During the year, the value of the car depreciated by 11.5% Write down a calculation to find the current value of the car. **<u>Solution</u>** 25000×0.885 **[2Marks]**
10	Jamie is a classic car dealer. At the beginning of 2005, he purchased a 20-year-old Porsche 911 sports car for £55000. During 2006 and 2007, the value of the car increase by 9% and 11% respectively. At the end of 2008, the car was sold for £60,000 Did the value of the car appreciate during 2008? Show how you decide. **<u>Solution</u>** For 2006 and 2007: $55000 \times 1.09 \times 1.11 = £66544.50$ **[1mark]** So, the car was worth £66544.50 at the end of 2007 but it was sold for £60,000 the following year. Therefore, the car lost some of its value in 2008 **[1mark]**