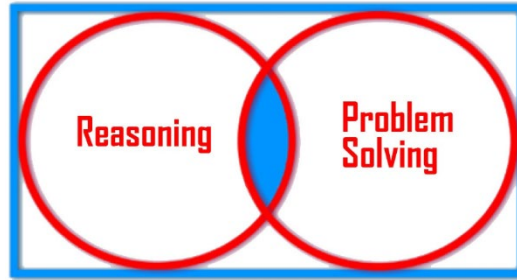


## GCSE Foundation (5 – 1)



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### Mathematical Reasoning Questions

#### (Order of Operation) – Set 1

#### Solutions

**The questions are repeated here for your convenience**

<p><b>1</b></p>	<p>Complete the calculation below by filling in the missing numbers</p> <p style="text-align: center;"><b><u>Solution</u></b></p> $8 + (5 \times 3) - 7 = 4 + (\boxed{1} \times \boxed{17}) - 5 \quad \text{[2marks]}$ <p>LHS: <math>8 + 15 - 7 = 16</math>  RHS: <math>4 - 5 = -1</math>  Therefore, we need 17 from the brackets</p>
<p><b>2</b></p>	<p>Choose the correct answer for the calculation below</p> $5 + 3 \times 4^2 - 2 \times 2 - 3$ <p>a) 249  b) 46  c) 99  d) 10</p> <p><b><u>Solution</u></b></p> $= 5 + 3 \times 16 - 4 - 3$ $= 5 + 48 - 7 = 46$ <p>Correct Answer: B [1mark]</p>
<p><b>3</b></p>	<p>Insert brackets to make the following calculations correct</p> <p>a) <math>(81 \div 9) \times 12 - 4 = 104</math> [1mark]</p> <p>b) <math>81 \div 9 \times (12 - 4) = 72</math> [1mark]</p>
<p><b>4</b></p>	<p>Here is an incomplete calculation: <math>5 + 4 \times \boxed{5} = 25</math> [1mark]</p> <p>Write a number in the empty box so that, the calculation will give an answer which is a perfect square</p>
<p><b>5</b></p>	<p>Choose the correct answer for the calculation below</p> $7 + (5 - (5 - 9)^2)$ <p>a) 8  b) -4  c) -1  d) 4</p> <p>Correct Answer: B [1mark]</p>

<p><b>6</b></p>	<p>Write down the greatest value of <math>x</math> for which the calculation <math>(x - 3) - (-5 \times 2)</math> is less than zero.</p> <p style="text-align: center;"><b><u>Solution</u></b></p> $(x - 3) - (-5 \times 2) < 0$ $(x - 3) - (-10) < 0 \quad \text{[1mark]}$ $(x - 3) + 10 < 0$ $x - 3 < -10$ $x < -7 \quad \text{[1mark]}$ <p><math>x</math> has to be at most <math>-8</math> for the calculation to be less than zero <b>[1mark]</b></p>
<p><b>7</b></p>	<p>Which of the following calculations will give the largest answer?</p> <p style="text-align: center;"><b><u>Solution</u></b></p> <p>a) <math>\frac{1}{2} + \frac{1}{3} \times \frac{1}{4}</math></p> $= \frac{1}{2} + \frac{1}{12} = \frac{7}{12} \quad \text{[2marks]}$ <p>b) <math>\frac{1}{2} \times \frac{1}{3} + \frac{1}{4}</math></p> $\frac{1}{6} + \frac{1}{4} = \frac{2}{12} + \frac{3}{12} = \frac{5}{12} \quad \text{[2marks]}$ <p>Therefore, <math>\frac{1}{2} + \frac{1}{3} \times \frac{1}{4}</math> has the larger sum <b>[1mark]</b></p>
<p><b>8</b></p>	<p>Answer <b>True</b> or <b>False</b> to the following calculations</p> <p>a) <math>3 + 5 \times -4 = 17</math>  <math>3 + 5 \times -4 = -17</math> Therefore, <b>False</b> <span style="float: right;"><b>[1mark]</b></span></p> <p>b) <math>(6 + 3)(5 - 7) &lt; 0</math>  <math>9 \times -2 = -18</math> Therefore, <b>True</b> <span style="float: right;"><b>[1mark]</b></span></p> <p>c) <math>(7 - 12)^2 + 3 = -28</math>  <math>25 + 3 = 28</math> Therefore, <b>False</b> <span style="float: right;"><b>[1mark]</b></span></p>

**9** John wants to solve the calculation below

$$5[6 + (3 \times -5) + 2]$$

Write a set of instructions for John to use

**Solution**

1. Work out the brackets inside the square brackets first
2. Work out the sum inside the square brackets
3. Multiply your answer by 5

**[2marks]**

**10** Write a number in the empty box so that

$$\frac{16 + (8 - \square)}{3} = 5\frac{1}{7} + 1\frac{6}{7}$$

**Solution**

The RHS:  $6\frac{7}{7} = 7$  **[1mark]**

LHS: we need the entire numerator to be 21 so that when divided by 3 we can get 7.

That means we need the brackets to produce 5 which when added to 16 will give 21

That is,  $16 + (8 - \boxed{3}) = 21$  **[1mark]**