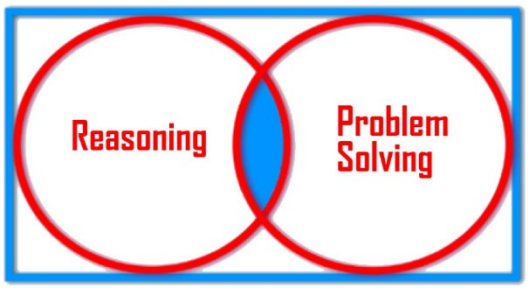
GCSE Foundation (5 – 1)



fluidmaths.co.uk

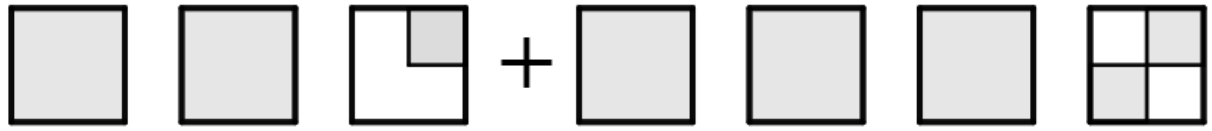
Mathematical Reasoning Questions

(Fractions) – Set 1

Solutions

The questions are repeated here for your convenience

1 By using fractions to represent the shaded area in each diagram, work out the total of the fractions shown in the diagrams below



Show all your workings clearly.
Give your answer as a mixed number

Solution

$2\frac{1}{4} + 3\frac{2}{4}$ **[1mark]**

$2 + 3 = 5$

$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

Therefore, $2\frac{1}{4} + 3\frac{2}{4} = 5\frac{3}{4}$ **[1mark]**

2 Match your calculations in **Set A** to the correct answer in **Set B**

Solution

Set A	Set B
$\frac{1}{a} + \frac{1}{a}$	1
$\frac{a}{3} - \frac{b}{5}$	$\left(\frac{a}{b}\right)^2$
$\frac{a}{b} \div \frac{a}{b}$	$\frac{2}{a}$
$\frac{a}{b} \times \frac{a}{b}$	$\frac{5a - 3b}{15}$

[4marks]

3

Here is a calculation: $\frac{3}{4}$ of $\boxed{?} = £75$

Junior's Answer

$75 \div 4 = 18.75$

$18.75 \times 3 = 56.25$

Therefore, $\boxed{?} = £56.25$

Explain why Junior's answer is inaccurate and give the correct answer.

Solution

£56.25 is less than £75 OR

The fraction of an amount cannot be greater than the original amount **[1mark]**

Correct calculation:

$75 \times 4 = 300$

$300 \div 3 = 100$ **[1mark]**

Therefore, $\boxed{?} = £100$

4

Circle the correct answer for the calculation $\frac{b}{a} + \frac{a}{b}$

Solution

a) $\frac{2ab}{ab}$

b) $\frac{a+b}{ab}$

c) $\frac{a^2+b^2}{ab}$ **[1mark]**

d) $\frac{a^2b^2}{ab}$

5 Katie is told to add $\frac{2}{3}$ to $\frac{4}{5}$

John is told to find the difference between the two fractions

Katie's Answer	John's Answer
$\frac{2}{3}+\frac{4}{5}$ $=\frac{2}{15}+\frac{4}{15}$ $=\frac{6}{15}$	$\frac{2}{3}-\frac{4}{5}$ $=\frac{-2}{-2}$ $=1$

Both Katie and John are wrong.

Identify their mistakes and carry out the correct calculations

Solution

Therefore, $\frac{2}{15}$ and $\frac{4}{15}$ are not equivalent fractions to $\frac{2}{3}$ and $\frac{4}{5}$ respectively. **[1mark]**

John did not convert any of the fractions into equivalent fractions. **[1mark]**

Correct calculations:

Katie's

$\frac{2}{3}+\frac{4}{5}=\frac{10}{15}+\frac{12}{15}$

$=\frac{22}{15}=1\frac{7}{15}$ **[1mark]**

John's

$\frac{4}{5}-\frac{2}{3}=\frac{12}{15}-\frac{10}{15}=\frac{2}{15}$ **[1mark]**

6	Find the number which lie exactly half-way between $-1\frac{5}{7}$ and 3 **Solution** Add the 2 numbers together $-\frac{12}{5}+\frac{3}{1}$ $=-\frac{12}{5}+\frac{15}{5}$ $=\frac{3}{5}$ **[2marks]** Now divide by 2 That is $\frac{3}{5}\div 2$ $=\frac{3}{5}\times\frac{1}{2}=\frac{3}{10}$ **[2marks]**
7	Answer **True** or **False** to the following calculations **Solution** a) $\frac{1}{2}+\frac{1}{7}=\frac{2}{9}$ **False** **[1mark]** b) $\frac{1}{3}-\frac{1}{2}=\frac{1}{6}$ **False** **[1mark]** c) $\frac{1}{5}\times\frac{5}{7}\times\frac{4}{2}=\frac{2}{7}$ **True** **[1mark]** d) $\frac{3}{4}\div\frac{1}{20}=15$ **True** **[1mark]**
8	For each question you answered as **False** in **Question 7,** show the correct calculations **Solution** a) $\frac{1}{2}+\frac{1}{7}=\frac{7}{14}+\frac{2}{14}=\frac{9}{14}$ **[1mark]** b) $\frac{1}{3}-\frac{1}{2}=\frac{2}{6}-\frac{3}{6}=-\frac{1}{6}$ **[1mark]**

9 Here is a calculation:

$$\frac{2}{\square} - \frac{\square}{5} = \frac{7}{15}$$

Fill in the missing numbers to complete the calculation

Solution

Since the denominator of the answer is 15, then the denominator of 2 must be 3 and the numerator of 5 will be 1

That is:

$\frac{2}{\boxed{3}} - \frac{\boxed{1}}{5} = \frac{7}{15}$ **[2marks]**

Check:

$\frac{2}{3} - \frac{1}{5} = \frac{10}{15} - \frac{3}{15} = \frac{7}{15}$

10 If $x = 1\frac{2}{5}$ and $y = 1\frac{1}{4}$

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

Solution

a) $x + 3 \ \boxed{>} \ 2 + y$ **[2marks]**

$1\frac{2}{5} + 3 = 4\frac{2}{5}$

$2 + 1\frac{1}{4} = 3\frac{1}{4}$

b) $x \div 2 \ \boxed{<} \ 4 \div y$ **[3marks]**

$1\frac{2}{5} \div 2 = \frac{7}{6} \times \frac{1}{2} = \frac{7}{12}$

$4 \div 1\frac{1}{4}$

$= 4 \div \frac{5}{4} = 4 \times \frac{4}{5}$

$= \frac{16}{5} = 3\frac{1}{5}$