# FEEDBACK ON FRACTIONS TEST FOR A.F.

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*Tolentino Tuition, Grade 7 Mathematics*

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CONTENTS


3 OPERATION

4 LOWEST COMMON MULTIPLES

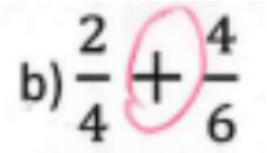
5 SIMPLEST FORM

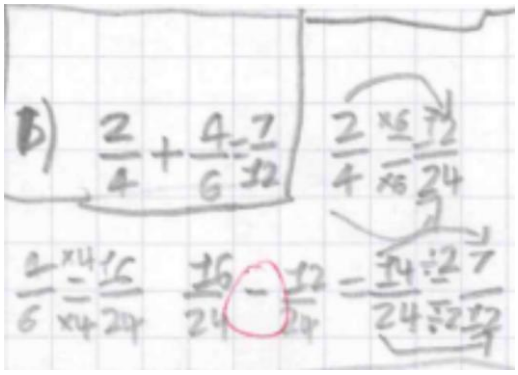
6 FRACTIONS ON NUMBER LINES

10 CLEAR CALCULATIONS

# OPERATION

**Question 3(b)**



Correct conversions! However, the operation should have been addition, rather than subtraction.

**Advice**

Doing our calculations by first rewriting the question, then performing our operations on a new line each time will help us keep track of what operation the question is asking for:

**Example**

$$b)\ \frac{2}{4}+\frac{4}{6}$$

$$=\frac{2\times6}{4\times6}+\frac{4\times4}{6\times4}$$

$$=\frac{12}{24}+\frac{16}{24}$$

$$=\frac{28}{24}$$

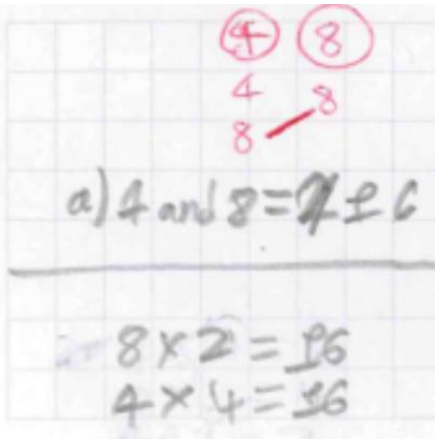
$$=\frac{28\div4}{24\div4}$$

$$=\frac{7}{6}$$

# LOWEST COMMON MULTIPLES

4. Find the lowest common multiple if the denominators of the fractions are:

a) 4 & 8




## Advice

To ensure that we do not miss any multiples, it is safest to list the multiples of each number starting from × 1, until a the lowest common multiple is found:

## Examples

1. Finding the lowest common multiple of 4 and 8:

$4 \times 1 = 4$
$4 \times 2 = 8$

$8 \times 1 = 8$

*The lowest common multiple of 4 and 8 is 8.*

1. Finding the lowest common multiple of 3, 6 and 8:

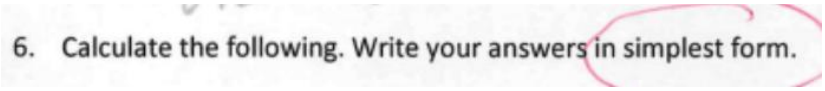
$3 \times 1 = 3$
$3 \times 2 = 6$
$3 \times 3 = 9$
$3 \times 4 = 12$
$3 \times 5 = 15$
$3 \times 6 = 18$
$3 \times 7 = 21$
$3 \times 8 = 24$

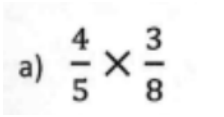
$4 \times 1 = 4$
$4 \times 2 = 8$
$4 \times 3 = 12$
$4 \times 4 = 16$
$4 \times 5 = 20$
$4 \times 6 = 24$

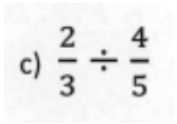
$8 \times 1 = 8$
$8 \times 2 = 16$
$8 \times 3 = 24$

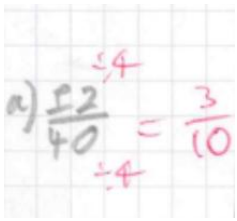
*The lowest common multiple of 3, 6 and 8 is 24.*

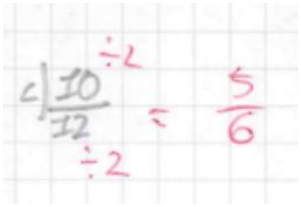
# SIMPLEST FORM




## Advice

If the numerator and denominator of a fraction are both even, then the fraction can always be simplified further by dividing by 2 (or sometimes a larger number to reach the simplest form quicker).

## Examples

1. $\frac{2}{12}$

   2 is even, and 12 is even, so we can divide by 2:

   $= \frac{2 \div 2}{12 \div 2} = \frac{1}{6}$

2. $\frac{4}{80}$

   4 is even, and 80 is even, so we could divide by 2, or alternatively divide by 4 to reach simplest form quicker:

   $= \frac{4 \div 4}{80 \div 4} = \frac{1}{20}$ OR $= \frac{4 \div 2}{80 \div 2} = \frac{2}{40} = \frac{2 \div 2}{40 \div 2} = \frac{1}{20}$

# FRACTIONS OF FRACTIONS

7. $\frac{2}{5}$ of the money raised at a charity event is given to a hospital.

The hospital spends $\frac{3}{4}$ of the money on a new X- ray machine.

What fraction of the total money raised was spent on the X-ray machine?

Give simplest form.

## Advice

This question may seem difficult as we are not given the *total amount* of money raised at the charity event.

However, the stem is asking for the 'fraction' of the total amount of money raised at the charity event– so we do not need to know the total amount of money!

## Solution

For these abstract questions, it is helpful to keep track of the *key values* given by the stem, of which there are 3:

1. $Total\ money\ raised = \frac{5}{5}$
2. $Money\ given = \frac{2}{5}$
3. $Money\ given\ that\ was\ spent = \frac{3}{4}\ of\ \frac{2}{5}$

Now, we know that when we are asked to find a fraction *of* something, we multiply that fraction by that something:

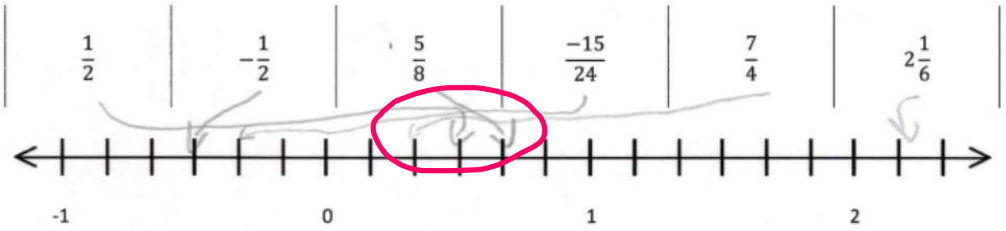
e.g. $\frac{1}{2}\ of\ 2 = \frac{1}{2} \times 2 = \frac{1}{2} \times \frac{2}{1} = \frac{2}{2} = 1$

But that 'something' doesn't always have to be a whole number – it could be a fraction!

$\frac{3}{4}\ of\ \frac{2}{5} = \frac{3}{4} \times \frac{2}{5} = \frac{6}{20}$ , $\frac{6}{20} = \frac{6 \div 2}{20 \div 2} = \frac{3}{10}$

# FRACTIONS ON NUMBER LINES

8. Place the following fractions in the correct position on the number line:



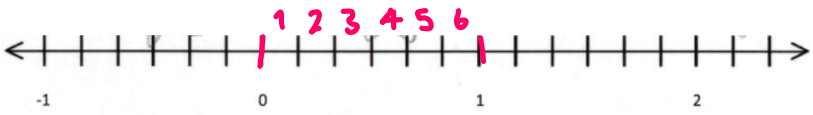

## Advice

Using arrows to 'place' the fractions on the number line may make it difficult for our marker to find our answers.

Also, we must provide *proof* as to why we have placed certain fractions in certain places on the number line. An effective way to do so is discussed below.

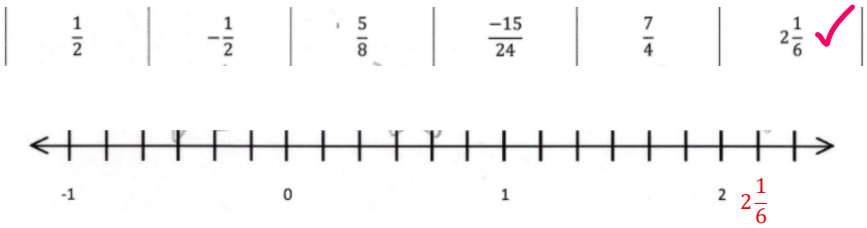
## Solution

We should first count the spaces between each *whole* number to determine what *fraction* each space represents:




Since there are 6 spaces between 0 and 1, each space represents $\frac{1}{6}$.

We can now place $2\frac{1}{6}$ on the number line




*Continued on Pages 8-9*

Placing the other fractions is not as easy, as they do not have denominators of 6. But, if we convert the other fractions to their *lowest common denominator* with $\frac{1}{6}$, we can place them!

Let's start with $\frac{1}{2}$ $-\frac{1}{2}$

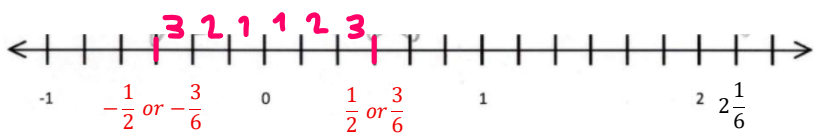
$\frac{1}{2}$ and $-\frac{1}{2}$ have a denominator of 2, and each space is $\frac{1}{6}$.

The lowest common multiple of 2 and 6 is 6, so

$\frac{1}{2} = \frac{1\times3}{2\times3} = \frac{3}{6}$ and each space is $\frac{1}{6}$

We can now place $\frac{1}{2}$ and $-\frac{1}{2}$ on the number line

$\frac{1}{2}$ ✓ $-\frac{1}{2}$ ✓ $\frac{5}{8}$ $\frac{-15}{24}$ $\frac{7}{4}$ $2\frac{1}{6}$ ✓




Now let's place $\frac{5}{8}$

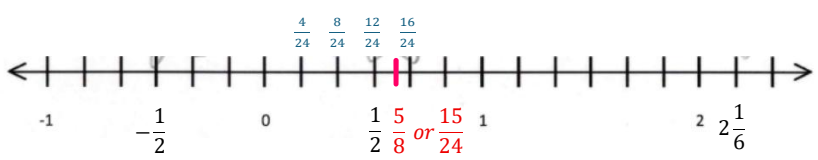
$\frac{5}{8}$ has a denominator of 8, and each space is $\frac{1}{6}$.

The lowest common multiple of 6 and 8 is 24, so

$\frac{5}{8} = \frac{5\times3}{8\times3} = \frac{15}{24}$ and each space is $\frac{1}{6} = \frac{1\times4}{6\times4} = \frac{4}{24}$

We can now place $\frac{5}{8}$ on the number line

$\frac{1}{2}$ ✓ $-\frac{1}{2}$ ✓ $\frac{5}{8}$ ✓ $\frac{-15}{24}$ $\frac{7}{4}$ $2\frac{1}{6}$ ✓



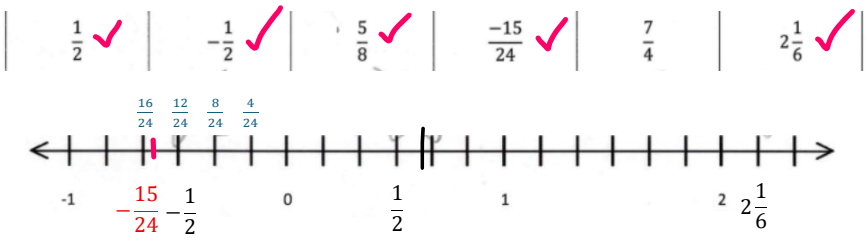
Now let's place $\frac{-15}{24}$

$-\frac{15}{24}$ has a denominator of 24, and each space is $\frac{1}{6}$.

The lowest common multiple of 24 and 6 is 24, so

$-\frac{15}{24}$ stays the same, and each space is $\frac{1}{6} = \frac{1\times4}{6\times4} = \frac{4}{24}$

We can now place $-\frac{15}{24}$ on the number line



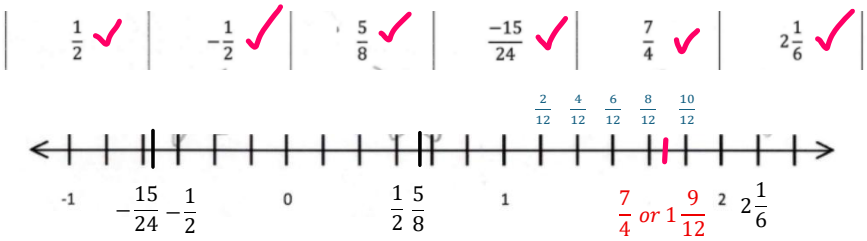

Finally, let's place $\frac{7}{4}$

$\frac{7}{4}$ has a denominator of 4, and each space is $\frac{1}{6}$.

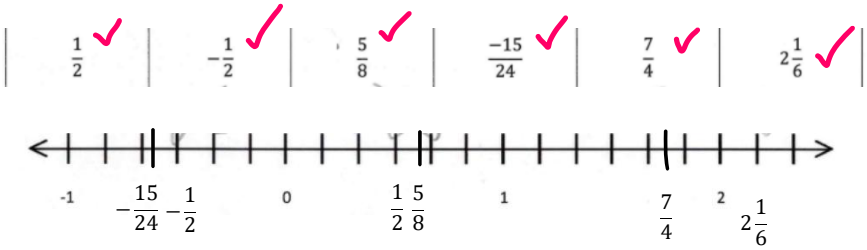
The lowest common multiple of 4 and 6 is 12, so

$\frac{7}{4} = \frac{7\times3}{4\times3} = \frac{21}{12} = 1\frac{9}{12}$ and each space is $\frac{1}{6} = \frac{1\times2}{6\times2} = \frac{2}{12}$

We can now place $\frac{7}{4}$ on the number line



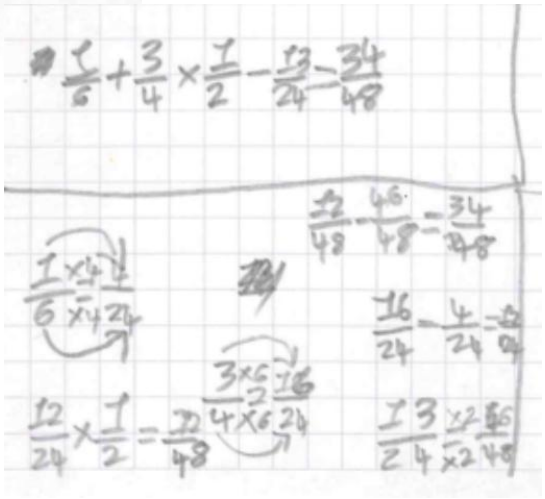

Our final answer:



# CLEAR CALCULATIONS

9. Evaluate the following:

$\frac{1}{6}+\frac{3}{4}\times\frac{1}{2}-\frac{13}{24}$



## Advice

We should keep in mind that another person will be marking our answers! It would be easier for them to understand our approach to a question if we set out our steps as *clearly as possible*. What is meant by this is shown below.

## Solution

$$\frac{1}{6}+\frac{3}{4}\times\frac{1}{2}-\frac{13}{24}$$

$$=\frac{1}{6}+\frac{3\times1}{4\times2}-\frac{13}{24}$$

$$=\frac{1}{6}+\frac{3}{8}-\frac{13}{24}$$

$$=\frac{1\times4}{6\times4}+\frac{3\times3}{8\times3}-\frac{13}{24}$$

$$=\frac{4}{24}+\frac{9}{24}-\frac{13}{24}$$

$$=\frac{13}{24}-\frac{13}{24}=0$$

Another example,

$$\frac{5}{6} - \frac{4}{9} + \frac{2}{9} \div \frac{2}{3}$$

$$= \frac{5}{6} - \frac{4}{9} + \frac{2}{9} \div \frac{2}{3}$$

$$= \frac{5}{6} - \frac{4}{9} + \frac{2 \times 3}{9 \times 2}$$

$$= \frac{5}{6} - \frac{4}{9} + \frac{6}{18}$$

$$= \frac{5 \times 3}{6 \times 3} - \frac{4 \times 2}{9 \times 2} + \frac{6}{18}$$

$$= \frac{15}{18} - \frac{8}{18} + \frac{6}{18}$$

$$= \frac{7}{18} + \frac{6}{18}$$

$$= \frac{13}{18}$$