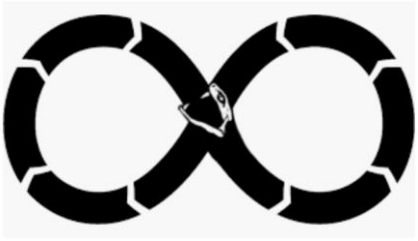
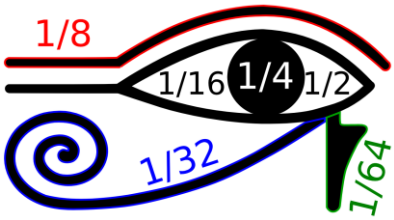
Fractions

Did you know?





5000 years ago the Egyptians used fractions but could only write unit fractions, fractions where the numerator is 1.

$\frac{1}{2}$ = 

$\frac{1}{3}$ = 

$\frac{1}{4}$ = 

All other fractions were written as sums of unit fractions but more about that later……

Fractions 1

1. What is the value of $\frac{2006}{8} + \frac{6002}{8}$

2. There are 84 animals in a field
   11 are cows
   45 are sheep
   The rest are pigs

   What fraction of the animals are pigs? Give you answer in simplest form

3. Simplify fully $\frac{x}{6} + \frac{3x}{4}$

4. Calculate $\frac{5}{6} \times \frac{3}{5}$

   give your answer in simplest form

5. What is the value of

6. How many of these calculations equal 1
   Give reasons

   $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} - \frac{1}{2}$ $\frac{1}{2} \times \frac{1}{2}$ $\frac{1}{2} \div \frac{1}{2}$

7. Sally has 30m of ribbon.
   She cuts lengths of $2\frac{3}{5}$ metres from the ribbon. Sally says she has enough ribbon to cut 12 lengths. Is she correct?
   You must show all workings

8. Express as a single fraction $\frac{2a}{3} - \frac{b}{4}$

You can do the next section for fun or move on if you got all of Fractions 1 correct

Fractions 2

1. Calculate $2\frac{1}{7} + 1\frac{1}{5}$
   Give your answer as a mixed number in simplest form

2. Simplify $\frac{4a}{5} \times \frac{7b}{3}$

3. Work out $\frac{19}{24} - \frac{3}{8}$
   giving your answer in simplest form

4. Find the mean of $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ and $\frac{1}{6}$
   give your answer in simplest form

5. A full glass of water can hold $\frac{1}{6}$ of a bottle of water.

   How many glasses can be filled by $2\frac{1}{5}$ bottles?

6. A water tank is $\frac{2}{3}$ full
   40 litres of water are taken from the tank
   The tank is now $\frac{1}{2}$ full
   What fraction of the tank was removed?

7. Which of these has the largest value

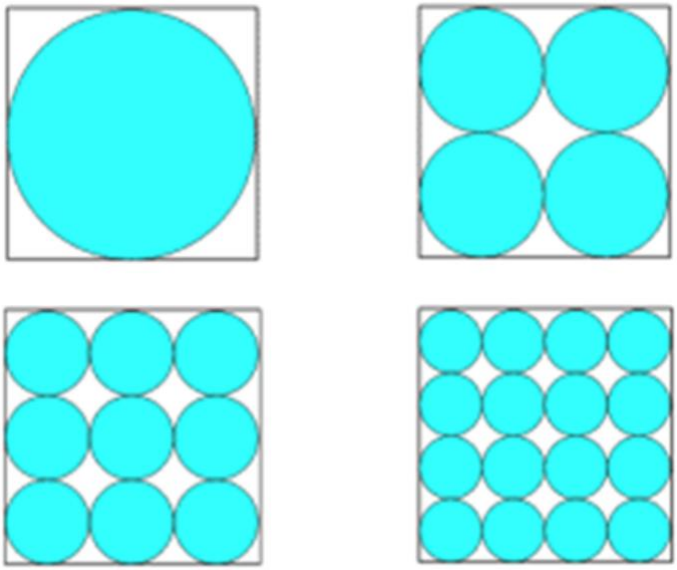
   $\frac{1}{2} + \frac{1}{4}$ $\frac{1}{2} - \frac{1}{4}$ $\frac{1}{2} \times \frac{1}{4}$ $\frac{1}{2} \div \frac{1}{4}$ $\frac{1}{4} \div \frac{1}{2}$

8. Simplify $\frac{a}{b} + \frac{b}{c}$

Circles

In the images below the square has a side length of 1 unit

Which of the images has the greatest area covered by the circles?



Petrol Tank

Andrea's car has a petrol tank that holds 44 litres of petrol.

She goes to the petrol station when her tank is a quarter full and fills it up until it is two thirds full.

How many litres of petrol does she put into the car's petrol tank?

Peaches

A monkey has 75 peaches

Each day he: keeps a fraction of his peaches
gives some away
eats 1 peach

These are the fractions he decided to keep.

$$\frac{1}{2} \quad \frac{1}{4} \quad \frac{3}{4} \quad \frac{3}{5} \quad \frac{5}{6} \quad \frac{11}{15}$$

In what order did he use the fractions so that he was left with just one peach at the end?

Integers

What is the integer x

so that $\frac{x}{9}$

lies between $\frac{71}{7}$ and $\frac{113}{11}$?

Fractions of 1000

What is $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ of $\frac{5}{6}$ of $\frac{6}{7}$ of $\frac{7}{8}$ of $\frac{8}{9}$ of $\frac{9}{10}$ of 1000 ?

Unit Fractions

Remember the Egyptians and their unit fractions? Now it's time to explore this further……

A unit fraction is a fraction that has a numerator of 1.

Other fractions can be written as the sum of two unit fractions.

Here are some examples some of which are correct and some which are not – can you find which ones are correct?

$\frac{1}{2} = \frac{1}{3} + \frac{1}{6}$ $\frac{1}{2} = \frac{1}{10} + \frac{1}{20}$ $\frac{1}{3} = \frac{1}{4} + \frac{1}{12}$ $\frac{1}{3} = \frac{1}{7} + \frac{1}{21}$ $\frac{1}{4} = \frac{1}{5} + \frac{1}{20}$

What rules might have been used to generate these?

Thinking about those that are correct what rule might you suggest for generating other unit fractions from the sum of two others?

Some unit fractions can be made in more than one way …..

Here are some to start you off $\frac{1}{6} = \frac{1}{7} + \frac{1}{42}$ $\frac{1}{6} = \frac{1}{8} + \frac{1}{24}$ can you find more ways to make $\frac{1}{6}$?

Can you finish this sum for $\frac{1}{8}$ and find more? $\frac{1}{8} = \frac{1}{9} + \frac{1}{\quad}$

Can all unit fractions be made in this way? Choose different unit fractions to test out your theories.