Cancelling Fractions

Exercise 1

Put these fractions into their lowest terms.

1) $\frac{3}{9}$	2) $\frac{4}{10}$	3) $\frac{4}{8}$	4) $\frac{2}{8}$	5) $\frac{3}{6}$	6) $\frac{6}{10}$
7) $\frac{4}{12}$	8) $\frac{4}{20}$	9) $\frac{5}{15}$	10) $\frac{10}{18}$	11) $\frac{8}{10}$	12) $\frac{7}{14}$
13) $\frac{15}{20}$	14) $\frac{4}{24}$	15) $\frac{15}{25}$	16) $\frac{15}{30}$	17) $\frac{15}{40}$	18) $\frac{16}{40}$
19) $\frac{16}{48}$	20) $\frac{14}{42}$	21) $\frac{15}{50}$	22) $\frac{15}{100}$	23) $\frac{40}{100}$	24) $\frac{15}{150}$
25) $\frac{15}{105}$	26) $\frac{45}{100}$	27) $\frac{150}{200}$	28) $\frac{65}{100}$	29) $\frac{105}{300}$	30) $\frac{150}{500}$

31) Cancel down each of these fractions and say which have a value of $\frac{2}{3}$

$\frac{12}{15}$, $\frac{8}{10}$, $\frac{7}{14}$, $\frac{6}{9}$, $\frac{6}{12}$, $\frac{8}{12}$, $\frac{10}{15}$, $\frac{14}{30}$, $\frac{12}{18}$, $\frac{12}{20}$,

$\frac{4}{6}$, $\frac{5}{15}$, $\frac{16}{20}$, $\frac{18}{27}$, $\frac{14}{21}$

32) Cancel down each of these fractions. List them in order of size, smallest first.

$\frac{12}{30}$, $\frac{12}{15}$, $\frac{5}{25}$, $\frac{12}{20}$

Exercise 2

In each case give your answer as a fraction in its lowest terms.

1) In a school of 1000 pupils, 550 are girls and 450 are boys.
   a) What fraction of the school are boys?
   b) What fraction of the school are girls?

2) An aeroplane flies from an airport in the UK to an airport in the USA. The total distance is 6,000 miles. It re-fuels after a distance of 4,500 miles. What fraction of the journey does it have left to do?

3) A village needs to collect £5,000 to repair the church steeple. When it has collected £3,500, what fraction of the total will it have left to collect?

4) Bill cuts a length of wood into two pieces. One measures 45cm and the other measures 65cm. What fractions has the wood been cut into?

5) Jill carries out a survey of people. She asks them whether they want a new supermarket in the district. She interviews 200 people. 90 people say they want a supermarket, 80 people say they don't want one and the rest are undecided. What fraction of the sample a) want the supermarket, b) don't want the supermarket and c) are undecided?

Mixed Fractions

Exercise 1

1) 25 students sit an examination. 15 pass and the remainder fail.
   a) What fraction of the students pass?
   b) What fraction of the students fail?

2) Gary walks from his home to the centre of town, a distance of 8 miles. When he has walked 2 miles he stops for a rest.
   a) What fraction of the journey has he travelled when he stops?
   b) What fraction of the journey has he got left?

3) ABRACADABRA
   a) What fraction of this word is made up of A's?
   b) What fraction of this word is made up of B's?
   c) What fraction of this word is made up of C's?
   d) What fraction of this word is made up of D's?
   e) What fraction of this word is made up of R's?

4) A bunch of flowers is made up of 9 yellow roses, 8 red roses and 3 white roses.
   a) What fraction of the bunch are yellow roses?
   b) What fraction of the bunch are red roses?
   c) What fraction of the bunch are white roses?

Exercise 2

1) Is $\frac{1}{16}$ bigger than $\frac{1}{8}$?

2) Is $\frac{1}{8}$ smaller than $\frac{1}{4}$?

3) Which is the smaller, $\frac{1}{4}$ or $\frac{1}{8}$?

4) How many $\frac{1}{4}$'s make $\frac{1}{2}$?

5) How many $\frac{1}{8}$'s make $\frac{1}{4}$?

6) How many $\frac{1}{8}$'s make $\frac{1}{2}$?

7) Write down these fractions in order of size, smallest to largest.

$\frac{1}{3}$ $\frac{1}{8}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{5}$ $\frac{1}{7}$ $\frac{1}{12}$

8) There are 200 people in a cinema audience. 150 are adults and the rest are children. What fraction of the audience are children?

9) Tim sows a packet of seeds. There are 50 seeds in the packet. If 35 seeds grow into plants, what fraction of the packet is this?

10) 90g of water is mixed with 5g of salt until the salt is dissolved.
   a) What fraction of the mixture is salt?
   b) What fraction of the mixture is water?

11) An alloy is made by combining two metals, copper and zinc. 50g of copper is put with 12g of zinc. What fraction of the alloy is zinc?

12) A recipe needs 400g of flour, 150g of butter and 50g of sugar. When the three are mixed together, what fraction will be a) flour, b) butter and c) sugar?

Calculating a Fraction

Exercise 1

Work these out, without using a calculator.

1) $\frac{1}{2}$ of 20 2) $\frac{1}{2}$ of 10 3) $\frac{1}{3}$ of 9 4) $\frac{1}{3}$ of 21 5) $\frac{1}{6}$ of 30 6) $\frac{1}{6}$ of 36

7) $\frac{1}{4}$ of 20 8) $\frac{1}{4}$ of 40 9) $\frac{1}{5}$ of 15 10) $\frac{1}{5}$ of 25 11) $\frac{1}{10}$ of 40 12) $\frac{1}{10}$ of 80

13) $\frac{1}{2}$ of 16 apples 14) $\frac{1}{3}$ of 30 cm. 15) $\frac{1}{4}$ of 24 hours 16) $\frac{1}{5}$ of 30 cakes

17) $\frac{1}{10}$ of 20 days 18) $\frac{1}{3}$ of 18 loaves 19) $\frac{1}{4}$ of 40 mm. 20) $\frac{1}{5}$ of 25 oranges

Exercise 2

Work these out without using a calculator

1) $\frac{2}{5}$ of 20 2) $\frac{3}{5}$ of 25 3) $\frac{3}{8}$ of 24 4) $\frac{3}{7}$ of 21 5) $\frac{5}{6}$ of 18 6) $\frac{3}{4}$ of 20

7) $\frac{5}{7}$ of 28 8) $\frac{7}{10}$ of 30 9) $\frac{5}{8}$ of 32 10) $\frac{3}{10}$ of 40 11) $\frac{9}{10}$ of 50 12) $\frac{5}{12}$ of 60

13) $\frac{3}{4}$ of 40 apples 14) $\frac{3}{5}$ of 35 cakes 15) $\frac{2}{3}$ of 21 days

16) $\frac{5}{8}$ of 40 mm. 17) $\frac{4}{5}$ of £60 18) $\frac{7}{8}$ of 64 metres

Exercise 3

Use a calculator to work out each of the following.

1) $\frac{3}{7}$ of 154.7 metres 2) $\frac{1}{8}$ of 22 metres 3) $\frac{3}{4}$ of 25 metres 4) $\frac{5}{7}$ of 14.7kg

5) $\frac{2}{3}$ of 27.3kg 6) $\frac{7}{9}$ of 129.87kg 7) $\frac{3}{8}$ of 154 metres 8) $\frac{5}{12}$ of 16.8 metres

9) $\frac{3}{7}$ of 2.45 metres 10) $\frac{7}{15}$ of 7.5 litres 11) $\frac{4}{9}$ of 29.7 litres 12) $\frac{11}{15}$ of 97.5 litres

Exercise 4

1) If $\frac{1}{4}$ of a number is 6, what is the number?

2) If $\frac{1}{3}$ of a number is 12, what is the number?

3) 39 sweets are shared between two people. David gets $\frac{1}{3}$ of them and Karen gets the rest. How many do they each get?

4) $\frac{2}{5}$ of the pupils in a school are girls and the rest are boys.

a) What fraction of the school are boys?

b) If there are a total of 900 pupils in the school, how many are boys?

5) Tom earns £250 per week. He calculates that $\frac{3}{20}$ of this is taken from him in tax. How much tax will he pay?

6) A supermarket buys 240 cabbages. $\frac{3}{4}$ of these are sold at their full price. The remainder are reduced in price. How many are sold at full price?

7) At a football match, $\frac{3}{8}$ of the crowd support Manchester United. The rest support Chelsea. Altogether there are 60,000 people at the match. How many

a) Support Manchester United b) Support Chelsea?

Fraction Problems

1) Tara earns £140 per week. She spends $\frac{1}{5}$ of it on food and $\frac{2}{5}$ on rent.
   a) How much does she spend on food?
   b) How much does she spend on rent?

2) Edwin and Polly share a job. The total pay for the job is £250 per week. They are paid according to the amount of time they work. Edwin works for 24 hours and Polly works for 16 hours.
   a) What fraction of the week did Edwin work?
   b) What fraction of the week did Polly work?
   c) How much per week is Edwin paid?
   d) How much per week is Polly paid?

3) Nicholas earns £320 per week. He has an increase in pay of £20.
   a) What is his pay rise as a fraction of his old wages?
   Louisa also has a pay rise of £20. Her new wage is £380.
   b) What is her pay rise as a fraction of her old wages?

4) Harriet has 400 beads, all of the same shape. $\frac{3}{8}$ of them are blue and the remainder are red.
   a) What fraction of the beads are red?
   b) How many red beads has she?

5) Matthew travels by coach to Prague in the Czech Republic. On the first day he travels 700 kilometres, and on the second day he travels 800 kilometres.
   a) What is his total journey?
   b) What fraction of the journey did he do on the first day?
   c) What fraction of the journey did he do on the second day?
   Matthew travelled back home along the same route. This time he took three days. On the first day he completed $\frac{2}{5}$ of the journey. On the second day he completed a further $\frac{1}{3}$ of the journey.
   d) What fraction of the journey did he do on the third day?
   e) How many kilometres did he do on each of the three days?

6) A large tank will hold 8,000 litres of water when full.
   a) If it is only $\frac{3}{16}$ full, how much water is in it?
   A further 2,500 litres are added to the tank.
   b) What fraction of the tank is now full?
   Oliver has to put more water into the tank until it is $\frac{9}{10}$ full.
   c) How much more water will he put into it?

Adding and Subtracting Fractions

Do not use a calculator

1) Add and subtract these fractions.

a) $\frac{1}{2} + \frac{1}{4}$ b) $\frac{1}{2} + \frac{3}{4}$ c) $\frac{1}{2} - \frac{1}{4}$ d) $1 + \frac{1}{4}$

e) $1 + 1\frac{1}{4}$ f) $2\frac{1}{4} - 1\frac{1}{4}$ g) $1\frac{1}{4} - \frac{3}{4}$ h) $\frac{3}{4} + \frac{3}{4}$

i) $1\frac{3}{4} - \frac{3}{4}$ j) $2\frac{1}{4} - 1\frac{1}{2}$ k) $4\frac{1}{2} + 2\frac{1}{4}$ l) $3\frac{3}{4} + 2\frac{1}{4}$

m) $6\frac{1}{4} - 2\frac{1}{2}$ n) $2\frac{1}{2} - 1\frac{3}{4}$ o) $1\frac{3}{4} + 3\frac{1}{2}$ p) $3\frac{1}{2} - 2\frac{3}{4}$

2) Add and subtract these fractions.

a) $\frac{3}{5} + \frac{1}{5}$ b) $\frac{3}{10} + \frac{4}{10}$ c) $\frac{3}{8} + \frac{4}{8}$ d) $\frac{3}{6} + \frac{2}{6}$

e) $\frac{2}{20} + \frac{1}{20}$ f) $\frac{1}{10} + \frac{6}{10}$ g) $\frac{9}{10} - \frac{2}{10}$ h) $\frac{7}{16} - \frac{2}{16}$

i) $\frac{5}{12} + \frac{2}{12}$ j) $\frac{7}{15} - \frac{3}{15}$ k) $\frac{8}{21} - \frac{4}{21}$ l) $\frac{6}{18} + \frac{7}{18}$

m) $\frac{14}{24} - \frac{7}{24}$ n) $\frac{13}{17} + \frac{3}{17}$ o) $\frac{14}{15} - \frac{3}{15}$ p) $\frac{7}{10} + \frac{2}{10}$

3) Cancel down these fractions into their lowest terms.

a) $\frac{3}{9}$ b) $\frac{3}{12}$ c) $\frac{2}{8}$ d) $\frac{4}{8}$ e) $\frac{4}{20}$ f) $\frac{5}{20}$ g) $\frac{12}{24}$ h) $\frac{7}{21}$ i) $\frac{10}{15}$ j) $\frac{15}{36}$ k) $\frac{15}{50}$

4) Change these pairs of fractions into fractions having the save denominator.

a) $\frac{4}{20}$ and $\frac{4}{5}$ b) $\frac{3}{12}$ and $\frac{1}{6}$ c) $\frac{5}{15}$ and $\frac{4}{5}$ d) $\frac{1}{2}$ and $\frac{4}{5}$

e) $\frac{3}{4}$ and $\frac{1}{5}$ f) $\frac{2}{7}$ and $\frac{3}{4}$ g) $\frac{4}{9}$ and $\frac{3}{6}$ h) $\frac{2}{12}$ and $\frac{2}{9}$

i) $\frac{2}{11}$ and $\frac{1}{3}$ j) $\frac{5}{7}$ and $\frac{4}{21}$ k) $\frac{7}{10}$ and $\frac{2}{5}$ l) $\frac{3}{16}$ and $\frac{5}{12}$

5) Add together these pairs of fractions (simplify wherever necessary)

a) $\frac{1}{15} + \frac{4}{5}$ b) $\frac{1}{8} + \frac{3}{4}$ c) $\frac{5}{9} + \frac{1}{3}$ d) $\frac{3}{10} + \frac{1}{4}$ e) $\frac{1}{8} + \frac{3}{20}$

f) $\frac{7}{15} + \frac{1}{3}$ g) $\frac{1}{14} + \frac{1}{7}$ h) $\frac{6}{20} + \frac{1}{4}$ i) $\frac{7}{8} + \frac{1}{12}$ j) $\frac{3}{7} + \frac{1}{4}$

6) Subtract these pairs of fractions (simplify wherever necessary)

a) $\frac{11}{15} - \frac{1}{5}$ b) $\frac{9}{14} - \frac{1}{7}$ c) $\frac{17}{20} - \frac{1}{0}$ d) $\frac{7}{8} - \frac{1}{16}$ e) $\frac{6}{7} - \frac{1}{2}$

f) $\frac{13}{15} - \frac{1}{20}$ g) $\frac{17}{18} - \frac{3}{4}$ h) $\frac{5}{9} - \frac{1}{4}$ i) $\frac{7}{10} - \frac{1}{2}$ j) $\frac{5}{6} - \frac{3}{20}$

More Fractions

Do not use a calculator

1) Add together these pairs of fractions.
Write down your answers in their simplest form

a) $\frac{11}{20} + \frac{3}{5}$ b) $\frac{9}{10} + \frac{1}{5}$ c) $\frac{11}{20} + \frac{3}{5}$ d) $\frac{7}{8} + \frac{3}{16}$

e) $\frac{4}{7} + \frac{3}{4}$ f) $\frac{4}{5} + \frac{13}{20}$ g) $\frac{17}{20} + \frac{1}{4}$ h) $\frac{5}{7} + \frac{1}{2}$

i) $\frac{6}{11} + \frac{3}{4}$ j) $\frac{7}{10} + \frac{13}{25}$ k) $\frac{9}{15} + \frac{5}{6}$ l) $\frac{7}{12} + \frac{3}{4}$

m) $\frac{5}{11} + \frac{2}{3}$ n) $\frac{9}{10} + \frac{1}{2}$ o) $\frac{5}{8} + \frac{9}{16}$ p) $\frac{13}{15} + \frac{1}{3}$

q) $\frac{11}{14} + \frac{3}{7}$ r) $\frac{9}{20} + \frac{3}{4}$ s) $\frac{5}{8} + \frac{7}{12}$ t) $\frac{5}{9} + \frac{2}{3}$

2) Add and subtract these fractions.

a) $1\frac{11}{15} + \frac{2}{5}$ b) $1\frac{9}{20} - \frac{3}{5}$ c) $1\frac{9}{20} + \frac{2}{5}$ d) $1\frac{7}{9} - \frac{5}{18}$

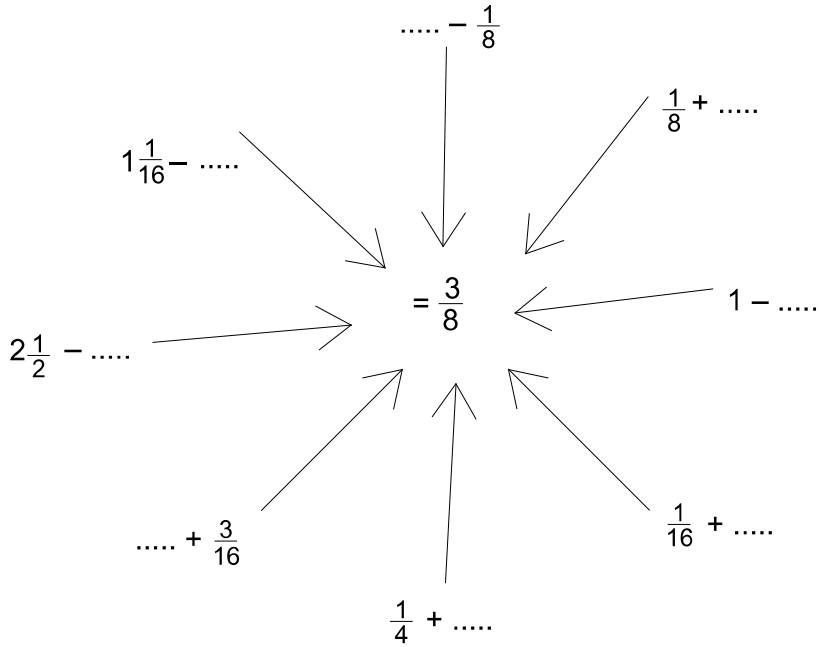
e) $2\frac{4}{5} - \frac{1}{4}$ f) $2\frac{3}{5} + \frac{7}{20}$ g) $2\frac{13}{20} - \frac{1}{2}$ h) $2\frac{5}{6} + \frac{1}{2}$

i) $2\frac{3}{11} + 2\frac{1}{4}$ j) $2\frac{7}{20} - 1\frac{13}{40}$ k) $2\frac{7}{12} + 2\frac{1}{6}$ l) $2\frac{5}{6} - 1\frac{3}{5}$

m) $\frac{4}{11} + 3\frac{1}{3}$ n) $3\frac{9}{14} - 2\frac{1}{7}$ o) $2\frac{3}{8} - \frac{7}{16}$ p) $6\frac{2}{5} + 2\frac{2}{3}$

q) $2\frac{11}{15} - 1\frac{3}{5}$ r) $5\frac{11}{20} + \frac{1}{4}$ s) $3\frac{7}{10} + 3\frac{7}{15}$ t) $4\frac{5}{11} - 1\frac{1}{2}$

3) Fill in the missing numbers in the following. All the answers are $\frac{3}{8}$.



Fractions

1) A tank contains 10,000 litres of water when full. It begins to leak. After the first day half of the water is lost. After the second day half of the remainder is lost. After the third day half of the remainder from the second day is lost. This continues, losing half of the remainder from the previous day.
   At the end of 5 days the leak is discovered.
   a) What fraction of the water has been lost?
   b) What fraction of the water remains?
   c) How much water has to be put back into the tank in order to fill it up?

2) A cake is cut up into a number of equal pieces. Alan, Bethan, Clive and Deborah take pieces of the cake.
   Alan has $\frac{1}{3}$ of the cake. Bethan has $\frac{1}{4}$ of the cake. Clive has $\frac{1}{6}$ of the cake. Deborah now takes one third of the remainder. This leaves two pieces. How many pieces was the cake cut into?

3) Afram travels by car to Italy. On the first day he travels 350 miles. On the second day he travels 250 miles and on the third day he travels 280 miles. If he now has $\frac{4}{15}$ of his journey left to do, what is the total length of his journey?

4) The list below shows how Marie spends her weekly wages.

	Proportion of wages
Rent	$\frac{2}{7}$
Shopping	$\frac{5}{28}$
Clothes	$\frac{1}{28}$
Energy (Electricity etc)	$\frac{1}{14}$
Transport	$\frac{1}{14}$
Luxuries and Entertainment	$\frac{1}{7}$
Other	

   a) What fraction of her weekly wages is spent on 'other'?
   b) If Marie spends £20 on transport, what is her total weekly wage?

5) Biscuits occupy $\frac{7}{8}$th of the volume of their packet. The remaining $\frac{1}{8}$ is unused. It is decided to re-design the packet so that the amount of unused space is reduced by 40%. What fraction of the packet will the biscuits now take up?