Fractions 1 – Fractions of quantities.

1. Calculate a) $\frac{1}{2}$ of 18 b) $\frac{1}{3}$ of 12 c) $\frac{1}{5}$ of 45

   d) $\frac{1}{8}$ of 24 e) $\frac{1}{7}$ of 56 f) $\frac{1}{4}$ of 48

   g) $\frac{1}{100}$ of 2000 h) $\frac{1}{20}$ of 400 i) $\frac{1}{30}$ of 1200

2. Calculate a) $\frac{2}{3}$ of 15 b) $\frac{3}{4}$ of 12 c) $\frac{2}{7}$ of 21

   d) $\frac{5}{8}$ of 32 e) $\frac{5}{6}$ of 54 f) $\frac{7}{9}$ of 72

   g) $\frac{6}{13}$ of 26 h) $\frac{4}{15}$ of 60 i) $\frac{6}{17}$ of 51

   j) $\frac{4}{30}$ of 150 k) $\frac{7}{100}$ of 9000 l) $\frac{3}{200}$ of 1000

3. In a closing down sale, a shop is offering $\frac{2}{3}$ off all items.

   Find the sale price of each item, Wallpaper £14.40 per roll,
   Rugs £99, Paint £10.80, Trim £2.70 per metre.

Fractions 2 – Simplification

Leave answers as improper (top-heavy) fractions where appropriate.

1. Simplify a) $\frac{3}{6}$ b) $\frac{2}{8}$ c) $\frac{4}{20}$ d) $\frac{6}{48}$

   e) $\frac{9}{81}$ f) $\frac{3}{21}$ g) $\frac{12}{60}$ h) $\frac{125}{500}$

2) Simplify a) $\frac{4}{6}$ b) $\frac{6}{10}$ c) $\frac{9}{12}$ d) $\frac{6}{15}$

   e) $\frac{24}{40}$ f) $\frac{21}{63}$ g) $\frac{24}{54}$ h) $\frac{40}{55}$

3) Simplify a) $\frac{15}{3}$ b) $\frac{28}{7}$ c) $\frac{18}{12}$ d) $\frac{72}{27}$

   e) $\frac{72}{18}$ f) $\frac{55}{35}$ g) $\frac{28}{8}$ h) $\frac{108}{60}$

4) Simplify a) $\frac{4}{14}$ b) $\frac{180}{120}$ c) $\frac{95}{130}$ d) $\frac{45}{81}$

   e) $\frac{42}{60}$ f) $\frac{52}{48}$ g) $\frac{39}{26}$ h) $\frac{168}{196}$

5) Over a period of 180 days, a ferry is cancelled on 24 days due to bad weather. Express the cancellations as a simplified fraction.

Fractions 3 – Improper fractions and mixed numbers.

1. Change each mixed number to an improper (top-heavy) fraction.

a) $1\frac{1}{2}$ b) $2\frac{1}{4}$ c) $3\frac{1}{5}$ d) $7\frac{1}{3}$ e) $5\frac{1}{6}$

f) $1\frac{2}{3}$ g) $3\frac{4}{5}$ h) $7\frac{3}{8}$ i) $2\frac{8}{9}$ j) $6\frac{5}{7}$

2. Change each improper fraction to a mixed number.

a) $\frac{5}{2}$ b) $\frac{13}{3}$ c) $\frac{46}{9}$ d) $\frac{56}{5}$ e) $\frac{50}{7}$

f) $\frac{31}{4}$ g) $\frac{29}{6}$ h) $\frac{53}{8}$ i) $\frac{143}{7}$ j) $\frac{901}{9}$

3. Change any mixed numbers to improper fractions and improper fractions to mixed numbers.

a) $5\frac{1}{4}$ b) $\frac{28}{11}$ c) $3\frac{5}{8}$ d) $\frac{31}{7}$ e) $14\frac{2}{3}$

f) $\frac{87}{9}$ g) $12\frac{5}{7}$ h) $\frac{123}{11}$ i) $7\frac{8}{9}$ j) $\frac{6400}{700}$

Fractions 4 – Equivalent fractions.

1. Copy and complete:

a) $\frac{1}{2} = \frac{\_}{4}$ b) $\frac{1}{4} = \frac{\_}{12}$ c) $\frac{1}{5} = \frac{\_}{20}$ d) $\frac{1}{9} = \frac{\_}{54}$ e) $\frac{1}{12} = \frac{\_}{240}$

f) $\frac{1}{3} = \frac{5}{\_}$ g) $\frac{1}{6} = \frac{3}{\_}$ h) $\frac{1}{11} = \frac{9}{\_}$ i) $\frac{1}{7} = \frac{7}{\_}$ j) $\frac{1}{10} = \frac{100}{\_}$

2. Copy and complete:

a) $\frac{2}{3} = \frac{\_}{9}$ b) $\frac{3}{4} = \frac{\_}{16}$ c) $\frac{2}{5} = \frac{\_}{25}$ d) $\frac{7}{9} = \frac{\_}{72}$ e) $\frac{11}{12} = \frac{\_}{48}$

f) $\frac{2}{3} = \frac{24}{\_}$ g) $\frac{5}{6} = \frac{30}{\_}$ h) $\frac{3}{8} = \frac{15}{\_}$ i) $\frac{4}{7} = \frac{36}{\_}$ j) $\frac{7}{10} = \frac{140}{\_}$

3. Copy and complete:

a) $\frac{6}{11} = \frac{\_}{33}$ b) $\frac{32}{\_} = \frac{4}{9}$ c) $\frac{\_}{56} = \frac{4}{7}$

d) $\frac{24}{\_} = \frac{3}{8}$ e) $\frac{5}{13} = \frac{\_}{39}$ f) $\frac{24}{21} = \frac{\_}{7}$

g) $\frac{18}{11} = \frac{54}{\_}$ h) $\frac{520}{\_} = \frac{26}{27}$ i) $\frac{13}{14} = \frac{\_}{280}$

4. Put fractions in order, smallest to largest. $\frac{1}{2}, \frac{7}{12}, \frac{1}{3}, \frac{5}{8}, \frac{11}{16}, \frac{7}{24}$

Fractions 5 – Adding and Subtracting.

Express answers in simplest form, and as mixed numbers where appropriate.

1. a) $\frac{1}{7}+\frac{2}{7}$ b) $\frac{3}{5}-\frac{1}{5}$ c) $\frac{5}{8}-\frac{3}{8}$ d) $\frac{5}{9}+\frac{1}{9}$

   e) $\frac{3}{16}-\frac{1}{16}$ f) $\frac{7}{9}+\frac{2}{9}$ g) $\frac{8}{11}+\frac{5}{11}$ h) $\frac{5}{9}+\frac{7}{9}$

2. a) $1\frac{1}{2}+4\frac{1}{2}$ b) $4\frac{2}{3}-1\frac{1}{3}$ c) $5\frac{7}{8}+\frac{5}{8}$

   d) $7\frac{2}{5}-2\frac{4}{5}$ e) $9\frac{2}{7}-4\frac{5}{7}$ f) $12\frac{4}{5}+12\frac{2}{5}$

3. a) $\frac{8}{5}-\frac{2}{5}$ b) $\frac{12}{7}+\frac{15}{7}$ c) $\frac{18}{11}-\frac{7}{11}$ d) $\frac{25}{6}-\frac{17}{6}$

   e) $1\frac{2}{9}+\frac{8}{9}$ f) $2\frac{3}{5}+\frac{4}{5}$ g) $\frac{15}{8}+6\frac{3}{8}$ h) $\frac{20}{3}-5\frac{2}{3}$

Fractions 6 – Adding and Subtracting.

Express answers in simplest form, and as mixed numbers where appropriate.

1. a) $\frac{1}{2}+\frac{1}{4}$ b) $\frac{1}{2}+\frac{1}{3}$ c) $\frac{1}{2}-\frac{2}{5}$ d) $\frac{1}{3}+\frac{1}{4}$

   e) $\frac{3}{16}-\frac{1}{8}$ f) $\frac{7}{8}-\frac{1}{4}$ g) $\frac{8}{9}-\frac{1}{2}$ h) $\frac{5}{6}+\frac{7}{9}$

   i) $\frac{4}{5}+\frac{2}{3}$ j) $\frac{2}{7}+\frac{2}{3}$ k) $\frac{3}{4}+\frac{8}{9}$ l) $\frac{1}{4}-\frac{1}{6}$

2. a) $1\frac{1}{2}+4\frac{1}{4}$ b) $5\frac{2}{3}-2\frac{1}{6}$ c) $2\frac{7}{8}+\frac{3}{4}$

   d) $4\frac{1}{4}-1\frac{2}{3}$ e) $9\frac{2}{5}-4\frac{3}{4}$ f) $3\frac{4}{5}+8\frac{5}{6}$

3. a) $\frac{8}{3}-\frac{2}{5}$ b) $\frac{9}{11}+\frac{8}{7}$ c) $\frac{17}{3}-\frac{7}{6}$ d) $\frac{25}{6}-\frac{7}{8}$

   e) $1\frac{5}{6}+\frac{8}{9}$ f) $2\frac{3}{5}+\frac{1}{2}$ g) $\frac{13}{8}+5\frac{3}{4}$ h) $\frac{21}{10}-1\frac{2}{7}$

4. A flight of $3\frac{2}{5}$ hours took off $1\frac{1}{2}$ hours ago. How long till landing?

Fractions 7 – Multiplying Fractions.

Express answers in simplest form, and as proper fractions or mixed numbers. Cancel terms before multiplying where possible.

1. a) $\frac{1}{2}\times\frac{1}{4}$ b) $\frac{1}{2}\times\frac{1}{3}$ c) $\frac{1}{2}\times\frac{3}{5}$ d) $\frac{1}{3}\times\frac{1}{4}$

   e) $\frac{3}{8}\times\frac{1}{4}$ f) $\frac{7}{8}\times\frac{1}{4}$ g) $\frac{7}{9}\times\frac{1}{2}$ h) $\frac{5}{6}\times\frac{7}{9}$

   i) $\frac{4}{5}\times\frac{2}{1}$ j) $\frac{2}{7}\times 6$ k) $\frac{3}{4}\times 7$ l) $\frac{7}{8}\times\frac{5}{4}$

2. a) $\frac{1}{2}\times\frac{2}{3}$ b) $\frac{3}{4}\times\frac{5}{6}$ c) $\frac{5}{7}\times\frac{3}{5}$ d) $\frac{2}{3}\times\frac{9}{10}$

   e) $\frac{3}{8}\times\frac{2}{15}$ f) $\frac{7}{8}\times\frac{1}{14}$ g) $\frac{7}{9}\times\frac{4}{21}$ h) $\frac{5}{6}\times\frac{2}{25}$

   i) $\frac{7}{12}\times\frac{2}{1}$ j) $\frac{2}{7}\times\frac{13}{14}$ k) $\frac{3}{10}\times\frac{7}{15}$ l) $\frac{17}{18}\times\frac{3}{34}$

3. a) $1\frac{1}{2}\times\frac{3}{4}$ b) $1\frac{3}{4}\times 2\frac{1}{5}$ c) $2\frac{1}{3}\times\frac{6}{7}$

   d) $2\frac{3}{8}\times 1\frac{3}{5}$ e) $1\frac{7}{8}\times 1\frac{5}{6}$ f) $3\frac{8}{9}\times 2\frac{2}{5}$

   g) $3\frac{3}{8}\times 5\frac{1}{3}$ h) $1\frac{2}{7}\times\frac{14}{15}$ i) $2\frac{4}{11}\times\frac{33}{52}$

Fractions 8 – Dividing Fractions.

Express answers in simplest form, and as proper fractions or mixed numbers. Cancel terms before multiplying where possible.

1. a) $\frac{1}{2} \div \frac{1}{3}$ b) $\frac{1}{2} \div \frac{1}{4}$ c) $\frac{1}{2} \div \frac{3}{5}$ d) $\frac{1}{3} \div \frac{1}{4}$

   e) $\frac{3}{8} \div \frac{1}{4}$ f) $\frac{7}{8} \div \frac{1}{4}$ g) $\frac{7}{9} \div \frac{1}{3}$ h) $\frac{5}{6} \div \frac{7}{9}$

   i) $\frac{4}{5} \div \frac{2}{1}$ j) $\frac{2}{7} \div 6$ k) $\frac{3}{4} \div 7$ l) $\frac{7}{8} \div \frac{5}{4}$

2. a) $\frac{1}{2} \div \frac{2}{3}$ b) $\frac{3}{4} \div \frac{5}{6}$ c) $\frac{5}{7} \div \frac{2}{21}$ d) $\frac{2}{3} \div \frac{8}{9}$

   e) $\frac{3}{5} \div \frac{2}{15}$ f) $\frac{7}{8} \div \frac{1}{14}$ g) $\frac{7}{9} \div \frac{4}{21}$ h) $\frac{5}{6} \div \frac{5}{12}$

   i) $\frac{12}{13} \div 6$ j) $\frac{2}{7} \div \frac{13}{14}$ k) $\frac{3}{10} \div \frac{7}{15}$ l) $\frac{9}{17} \div \frac{3}{34}$

3. a) $1\frac{1}{2} \div \frac{3}{4}$ b) $1\frac{2}{5} \div 2\frac{1}{5}$ c) $2\frac{1}{3} \div \frac{5}{6}$

   d) $2\frac{3}{8} \div 1\frac{1}{4}$ e) $1\frac{7}{8} \div 1\frac{5}{6}$ f) $3\frac{8}{9} \div 2\frac{2}{3}$

   g) $5\frac{2}{5} \div 1\frac{2}{7}$ h) $1\frac{2}{7} \div 3\frac{3}{5}$ i) $2\frac{4}{11} \div \frac{3}{44}$

Fractions 9 – Problems.

1. A cup contains $\frac{1}{6}$ of a litre of water. How much water will be required to fill 18 cups?

2. In a school of 1800 pupils, 30 are absent on a particular day. What fraction (in simplest form) of the pupils are absent?

3. June is on a diet and loses $\frac{1}{4}$ of a stone in July and $\frac{2}{5}$ of a stone in August.

   a) What fraction of a stone has she lost in total?
   b) There are 14 pounds in a stone. How many pounds has she lost? (Answer to the nearest pound)

4. Individual jam portions come in small tubs of $\frac{1}{90}$ of a litre.

   They are filled form containers with volume $4\frac{1}{3}$ litres.

   How many tubs can be filled from each container?

5. Find the area of a rectangle with length $1\frac{2}{5}$ m and breadth $\frac{5}{14}$ m.

6. A small box in the shape of a cuboid has volume 27cm^3.

   If it has length $1\frac{1}{2}$ cm and breadth $2\frac{1}{4}$ cm, find the height.

7. A father leaves his 19 camels to his 3 sons in his Will, the oldest getting $\frac{1}{2}$, the middle $\frac{1}{4}$, and the youngest $\frac{1}{5}$ of them.
   Unable to agree on how to split up the camels, their Uncle rides past on his camel and immediately solves the problem for them. He then rides off on his way again.
   How did he solve the problem?
   Investigate why the father flawed mathematically in his Will.