

Chapter 5

Fractions

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Written by

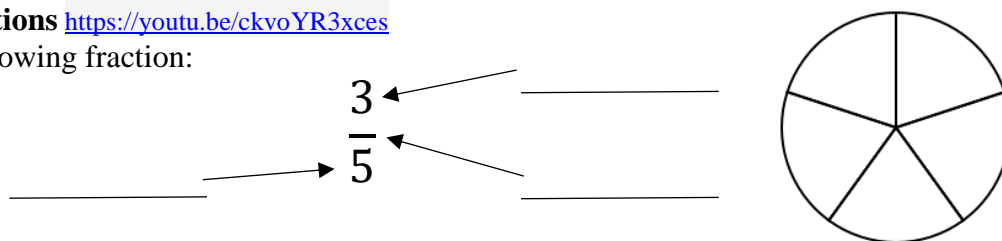
Benjamin Odgers

Mathematics Teacher

B Teaching / B Science

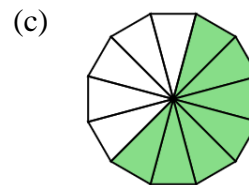
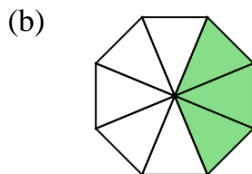
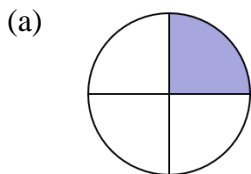
5A Introduction to Fractions <https://youtu.be/ckvoYR3xces>

Name the parts on the following fraction:



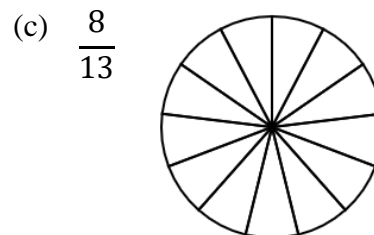
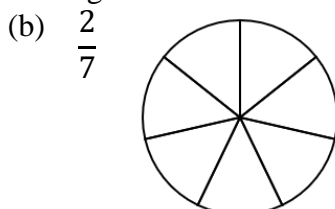
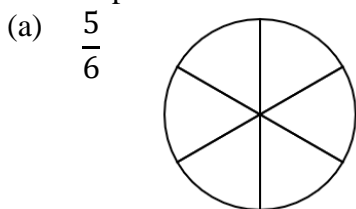
Question 1

What fraction of each shape below is shaded?



Question 2

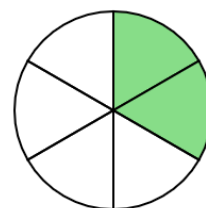
Shade each shape below so that they match the given fraction



Question 3

State whether the following sentences are true or false.

- (a) The fraction $\frac{4}{7}$ has a numerator of 4.
- (b) The fraction $\frac{2}{5}$ can be represented by the image at right.
- (c) The image at right can be represented by a fraction with a denominator of 6.



Pronunciation of Fractions <https://youtu.be/10XRlsgnVII>

Expressing fraction in the English language is very challenging. Most fractions follow these rules:

- The numerator is pronounced first by simply stating the number
- The denominator is pronounced second but is pronounced differently (usually with an added “th” sound). Refer to the table below for some pronunciations

Denominator	Pronunciation	Denominator	Pronunciation
2	Half	11	Eleventh
3	Third	20	Twentieth
4	Quarter	100	Hundredth
5	Fifth	1000	Thousandth
6	Sixth	2000	Two-thousandth
7	Seventh	24	Twenty-fourth
8	Eighth	31	Thirty-first
9	Ninth	32	Thirty-second
10	Tenth	33	Thirty-third

Notes:

Example 1 <https://youtu.be/UJog2clEITI>

Write the following fractions using words.

(a) $\frac{1}{6}$

(b) $\frac{2}{5}$

(c) $\frac{1}{2}$

(d) $\frac{2}{3}$

(e) $\frac{3}{4}$

(f) $\frac{11}{100}$

Question 4

Write the following fractions using words.

(a) $\frac{1}{7}$

(b) $\frac{3}{8}$

(c) $\frac{2}{4}$

(d) $\frac{4}{10}$

(e) $\frac{1}{9}$

(f) $\frac{3}{5}$

(g) $\frac{7}{15}$

(h) $\frac{1}{3}$

(i) $\frac{1}{2}$

(j) $\frac{1}{12}$

(k) $\frac{6}{17}$

(l) $\frac{9}{20}$

(m) $\frac{15}{31}$

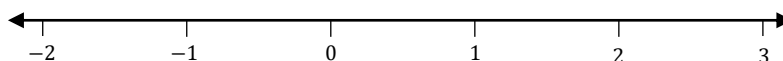
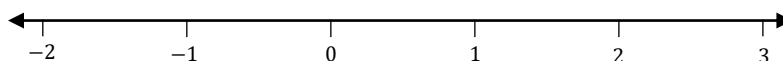
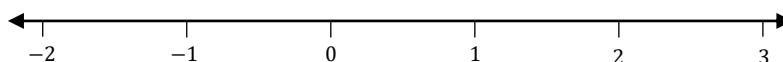
(n) $\frac{20}{100}$

(o) $\frac{8}{45}$

(p) $\frac{7}{42}$

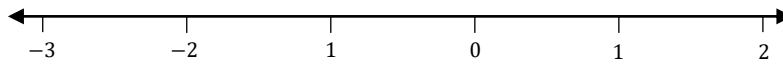
(q) $\frac{1}{63}$

(r) $\frac{2}{91}$

Example 2 https://youtu.be/OBcDWEdd_Wc(a) Label $\frac{4}{5}$ on the number line below.(b) Label $1\frac{3}{5}$ on the number line below.(c) Label $-\frac{2}{3}$ on the number line below.(d) Label $-1\frac{1}{3}$ on the number line below.**Question 5**(a) Label $\frac{3}{4}$ on the number line below.(b) Label $2\frac{1}{4}$ on the number line below.(c) Label $-\frac{2}{4}$ on the number line below.(d) Label $-1\frac{3}{4}$ on the number line below.

Question 6

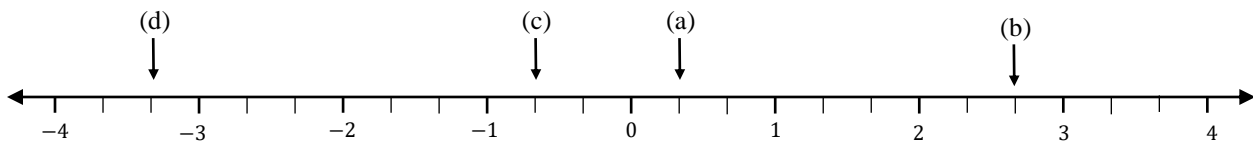
- (a) Label $\frac{1}{5}$ on the number line below. (b) Label $1\frac{2}{5}$ on the number line below.
- (c) Label $-2\frac{3}{5}$ on the number line below. (d) Label $1\frac{5}{5}$ on the number line below.



Question 7

State which fraction or mixed numeral has been labelled on the number line below. Note: A mixed numeral is a combination of a whole number and a fraction e.g. $1\frac{2}{5}$.

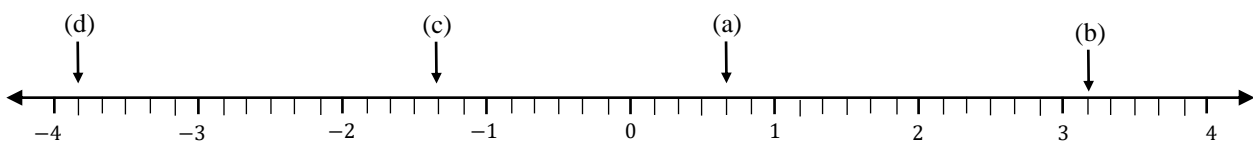
- (a) _____ (b) _____ (c) _____ (d) _____



Question 8

State which fraction or mixed numeral has been labelled on the number line below.

- (a) _____ (b) _____ (c) _____ (d) _____



Question 9

Insert the symbol $<$ or $>$ in the empty boxes below to make each statement true.

- (a) $\frac{4}{5}$ $\frac{2}{5}$ (b) $\frac{1}{3}$ $1\frac{2}{3}$ (c) $2\frac{2}{7}$ $1\frac{4}{7}$
- (d) $\frac{1}{6}$ $-\frac{5}{6}$ (e) $-\frac{3}{4}$ $3\frac{1}{4}$ (f) $-\frac{2}{9}$ $-\frac{4}{9}$

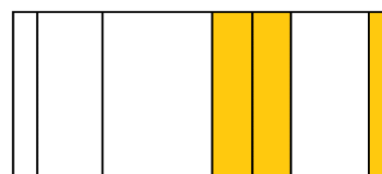
Question 10

Put the following numbers in **ascending** order.

- (a) $\frac{1}{8}, \frac{7}{8}, -\frac{3}{8}, \frac{4}{8}, 3\frac{2}{8}, -\frac{1}{8}, -2\frac{5}{8}$ (b) $\frac{5}{9}, -\frac{2}{9}, -\frac{4}{9}, 2\frac{8}{9}, -3\frac{5}{9}, \frac{7}{9}, -6\frac{1}{9}$

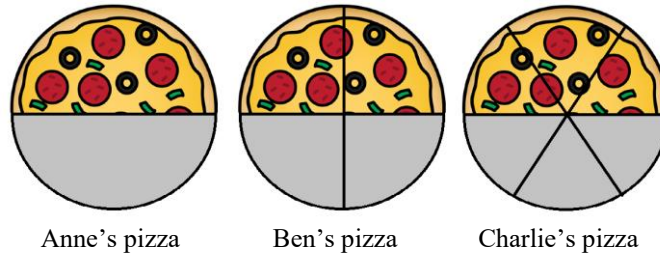
Question 11

Explain why the shape at right does **not** have $\frac{3}{7}$ shaded.



5B Equivalent Fractions <https://youtu.be/5kyAPzEaviv>

When you multiply a fraction's denominator and numerator by the same number you get another fraction that is equivalent to the fraction you started with. This is the fundamental rule of fractions. If you can remember this rule then you can solve most problems involving fractions.



Anne, Ben and Charlie all eat some pizza (as shown above). The grey area represents the amount of pizza that has been eaten. Explain why the fractions above are equivalent.

Example 1

Write 3 fractions that are equivalent to $\frac{2}{5}$.

Question 1

Write 3 fractions that are equivalent to each fraction below.

(a) $\frac{1}{3}$

(b) $\frac{3}{4}$

(c) $\frac{4}{5}$

(d) $\frac{5}{9}$

(e) $\frac{2}{7}$

(f) $\frac{7}{8}$

Example 2 <https://youtu.be/5mvKYJ-TLas>

The following fractions must remain equivalent. Fill in the blanks.

(a) $\frac{1}{2} = \frac{\quad}{4}$

(b) $\frac{3}{4} = \frac{3}{12}$

(c) $\frac{6}{7} = \frac{24}{\quad}$

(d) $\frac{10}{20} = \frac{\quad}{4}$

(e) $\frac{22}{\quad} = \frac{11}{3}$

(f) $\frac{\quad}{25} = \frac{3}{5}$

(g) $\frac{20}{8} = \frac{10}{\quad}$

(h) $\frac{9}{27} = \frac{\quad}{3}$

Question 2

The following fractions must remain equivalent. Fill in the blanks.

(a) $\frac{1}{3} = \frac{\quad}{6}$

(b) $\frac{2}{5} = \frac{\quad}{15}$

(c) $\frac{6}{7} = \frac{18}{\quad}$

(d) $\frac{5}{12} = \frac{\quad}{48}$

(e) $\frac{18}{\quad} = \frac{9}{10}$

(f) $\frac{\quad}{24} = \frac{3}{4}$

(g) $\frac{12}{15} = \frac{36}{\quad}$

(h) $\frac{5}{8} = \frac{\quad}{56}$

Question 3

The following fractions must remain equivalent. Fill in the blanks.

(a) $\frac{4}{10} = \frac{\quad}{5}$

(b) $\frac{6}{9} = \frac{\quad}{3}$

(c) $\frac{12}{15} = \frac{4}{\quad}$

(d) $\frac{16}{20} = \frac{\quad}{5}$

(e) $\frac{11}{\quad} = \frac{55}{60}$

(f) $\frac{\quad}{7} = \frac{9}{21}$

(g) $\frac{50}{80} = \frac{5}{\quad}$

(h) $\frac{24}{56} = \frac{\quad}{7}$

Question 4

The following set of fractions are equivalent. What number did we **multiply** the denominator and numerator by in order to make its equivalent fraction (the first one has been done for you)?

(a) $\frac{1}{2} = \frac{3}{6}$
Diagram: An arrow from 1 to 3 is labeled $\times 3$. An arrow from 2 to 6 is labeled $\times 3$.

(b) $\frac{3}{4} = \frac{9}{12}$

(c) $\frac{5}{8} = \frac{20}{32}$

(d) $\frac{6}{11} = \frac{36}{66}$

Question 5

The following set of fractions are equivalent. What number did we **divide** the denominator and numerator by in order to make its equivalent fraction (the first one has been done for you)?

(a) $\frac{6}{10} = \frac{3}{5}$
Diagram: An arrow from 6 to 3 is labeled $\div 2$. An arrow from 10 to 5 is labeled $\div 2$.

(b) $\frac{12}{15} = \frac{4}{5}$

(c) $\frac{25}{45} = \frac{5}{9}$

(d) $\frac{32}{48} = \frac{2}{3}$

Question 6

Circle the fractions below that are equivalent to $\frac{3}{5}$.

$\frac{6}{10}$, $\frac{5}{8}$, $\frac{12}{20}$, $\frac{1}{3}$, $\frac{30}{50}$, $\frac{5}{3}$, $\frac{15}{25}$, $\frac{5}{7}$

Question 7

Which fraction below is the largest? Circle your solution. Clue: convert each fraction to an equivalent fraction with a denominator of 12.

$\frac{6}{12}$, $\frac{3}{4}$, $\frac{1}{6}$, $\frac{10}{24}$, $\frac{2}{3}$, $\frac{4}{12}$, $\frac{7}{12}$, $\frac{5}{6}$

Question 8

Insert the symbol $<$, $=$ or $>$ in the empty boxes below to make each statement true. Clue: change one or both fraction(s) to an equivalent fraction such that they have the same denominator.

(a) $\frac{2}{3} \square \frac{5}{6}$

(b) $\frac{3}{4} \square \frac{8}{12}$

(c) $\frac{10}{15} \square \frac{2}{3}$

(d) $\frac{5}{7} \square \frac{13}{21}$

(e) $\frac{3}{4} \square \frac{4}{6}$

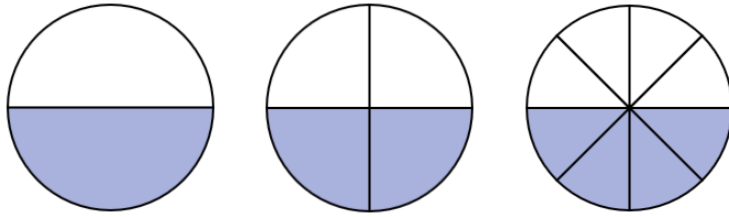
(f) $\frac{5}{12} \square \frac{3}{8}$

Question 9

What fraction is larger than $\frac{2}{3}$ and smaller than $\frac{8}{9}$?

5C Simplifying Fractions <https://youtu.be/prBi7-kueGI>

What fraction below is in simplest form? Why?



Simplification Method 1 – Dividing by Common Factors

We can simplify fractions by simply dividing the numerator and the denominator by the same number.

Below are some common factors we use to simplify fractions.

- Divide 2 (halving) – when both numbers are even
- Divide 3
- Divide 5 – when each number ends in a 0 or a 5
- Divide 7
- Divide 10 (cross off one zero above and below) - when both numbers end in a 0

Example 1 <https://youtu.be/iwTTEB0KWKI>

Express the following fractions in simplest form:

(a) $\frac{6}{8}$

(b) $\frac{6}{18}$

(c) $\frac{10}{50}$

(d) $\frac{25}{35}$

(e) $\frac{14}{21}$

(f) $3\frac{12}{16}$

(g) $\frac{5}{7}$

(h) $5\frac{150}{450}$

Question 1

Express the following fractions in simplest form:

(a) $\frac{8}{10}$

(b) $\frac{20}{30}$

(c) $\frac{9}{12}$

(d) $\frac{15}{25}$

(e) $\frac{7}{21}$

(f) $\frac{10}{35}$

(g) $\frac{8}{11}$

(h) $\frac{30}{90}$

(i) $\frac{70}{140}$

(j) $\frac{30}{42}$

(k) $\frac{24}{36}$

(l) $\frac{49}{56}$

(m) $1\frac{12}{16}$

(n) $5\frac{18}{27}$

(o) $3\frac{30}{42}$

(p) $2\frac{21}{28}$

Simplification Method 2 – Highest Common Factor (HCF) <https://youtu.be/7Cq11VO-yfk>

We can express fractions in simplest form by dividing the denominator and numerator by the highest common factor (HCF).

Example 2

Express the following fractions in simplest form by dividing the numerator and denominator by the HCF:

(a) $\frac{8}{12}$

(b) $\frac{30}{45}$

(c) $\frac{4}{11}$

(d) $\frac{7}{14}$

Question 2

Express the following fractions in simplest form by dividing the numerator and denominator by the HCF:

(a) $\frac{12}{16}$

(b) $\frac{10}{14}$

(c) $\frac{8}{18}$

(d) $\frac{3}{7}$

(e) $\frac{18}{24}$

(f) $\frac{16}{20}$

(g) $\frac{5}{9}$

(h) $\frac{18}{30}$

(i) $\frac{35}{50}$

(j) $\frac{28}{49}$

(k) $\frac{9}{54}$

(l) $\frac{35}{95}$

Simplification Method 3 – Prime Factors <https://youtu.be/P9u4o5N8M4c>

If we express the numerator and the denominator as a product of their prime factors we can easily express a fraction in its simplest form.

Example 3

Express the following fractions in simplest form by first expressing the numerator and denominator as a product of their prime factors.

(a) $\frac{12}{30}$

(b) $\frac{6}{11}$

(c) $\frac{36}{48}$

(d) $\frac{9}{18}$

Question 3

Express the following fractions in simplest form by first expressing the numerator and denominator as a product of their prime factors.

(a) $\frac{6}{15}$

(b) $\frac{2}{9}$

(c) $\frac{6}{24}$

(d) $\frac{14}{21}$

(e) $\frac{42}{60}$

(f) $\frac{28}{42}$

(g) $\frac{60}{84}$

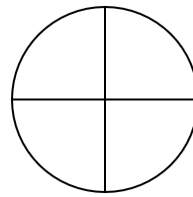
(h) $\frac{132}{231}$

Question 4

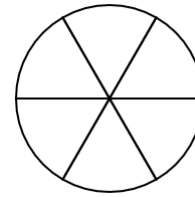
Three pizza shops make pizza's that are the same size but they cut them into different amounts.

- Bob's Pizza slices their pizza into 4 pieces.
- Chan's Pizza slices their pizza into 6 pieces.
- Donny's Pizza slices their pizza into 8 pieces.

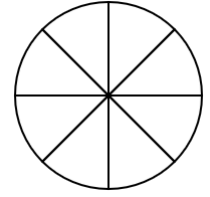
We can see this in the images at right.



Bob's



Chan's



Donny's

- How many pieces of Donny's pizza are equivalent to one piece of Bob's pizza?
- How many pieces of Chan's pizza are equivalent to four pieces of Donny's pizza?
- How many pieces of Bob's pizza are equivalent to $1\frac{1}{2}$ pieces of Chan's pizza?

Question 5

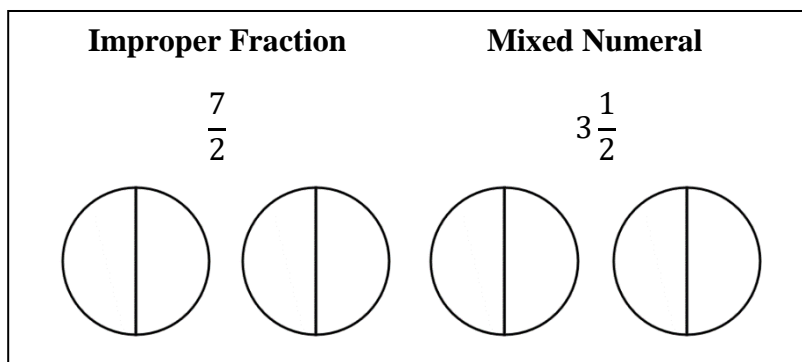
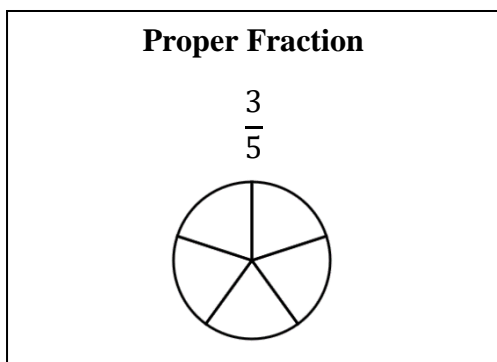
Cadbury chocolate bars are separated into 32 squares. What fraction of the chocolate bar did the following people eat? Represent your solution in simplest form.

- Georgia ate 5 squares of chocolate
- Terry ate 8 pieces of chocolate
- Nancy ate 20 pieces of chocolate

Question 6

- Can you simplify a fraction when the denominator is 1 more than the numerator? Some examples of these fractions are: $\frac{4}{5}, \frac{9}{10}, \frac{16}{17}$.
- Can you simplify a fraction when both the numerator and denominator are even numbers? Some examples of these fractions are: $\frac{4}{6}, \frac{10}{16}, \frac{20}{32}$.
- Can you simplify a fraction when the denominator and numerator both have prime numbers that are not the same? Some examples of these fractions are: $\frac{2}{5}, \frac{7}{11}, \frac{23}{37}$. Why?

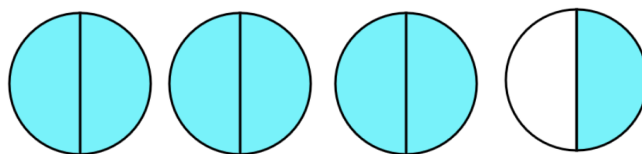
5D Improper Fractions and Mixed Numerals <https://youtu.be/1ZkYwCTLI3E>



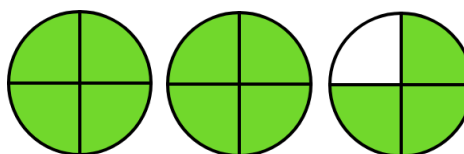
Example 1 <https://youtu.be/eYbEEcFPHCw>

Convert the following mixed numerals to improper fractions:

(a) $3\frac{1}{2}$



(b) $2\frac{3}{4}$



Question 1

Convert the following mixed numerals to improper fractions:

(a) $2\frac{1}{3}$

(b) $1\frac{2}{5}$

(c) $3\frac{3}{4}$

(d) $4\frac{2}{3}$

(e) $5\frac{1}{2}$

(f) $1\frac{3}{7}$

(g) $2\frac{5}{6}$

(h) $3\frac{3}{10}$

(i) $4\frac{5}{8}$

(j) $3\frac{1}{9}$

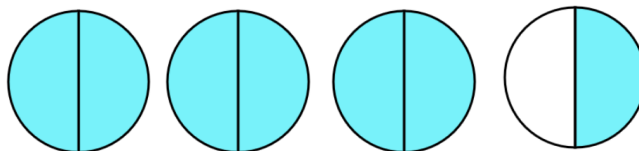
(k) $6\frac{3}{7}$

(l) $8\frac{5}{11}$

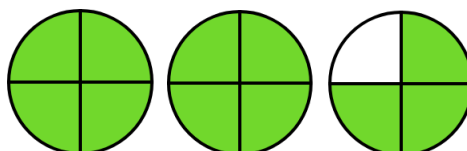
Example 2 <https://youtu.be/1jTRmjD44Ew>

Convert the following improper fractions to mixed numerals:

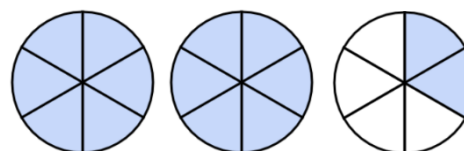
(a) $\frac{7}{2}$



(b) $\frac{11}{4}$



(c) $\frac{14}{6}$



Question 2

Convert the following improper fractions to mixed numerals:

(a) $\frac{7}{3}$

(b) $\frac{5}{2}$

(c) $\frac{9}{2}$

(d) $\frac{13}{4}$

(e) $\frac{7}{5}$

(f) $\frac{11}{6}$

(g) $\frac{20}{7}$

(h) $\frac{22}{9}$

(i) $\frac{15}{8}$

(j) $\frac{34}{11}$

(k) $\frac{24}{5}$

(l) $\frac{34}{7}$

Question 3

Convert the following improper fractions to mixed numerals, expressing your fractions in simplest form:

(a) $\frac{21}{6}$

(b) $\frac{26}{8}$

(c) $\frac{24}{10}$

(d) $\frac{24}{9}$

(e) $\frac{30}{12}$

(f) $\frac{33}{15}$

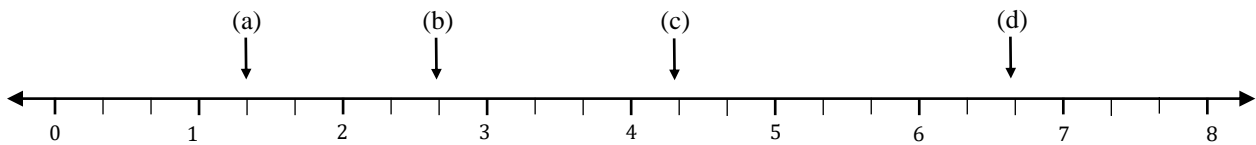
(g) $\frac{30}{14}$

(h) $\frac{34}{16}$

Question 4

State which improper fraction has been labelled on the number line below.

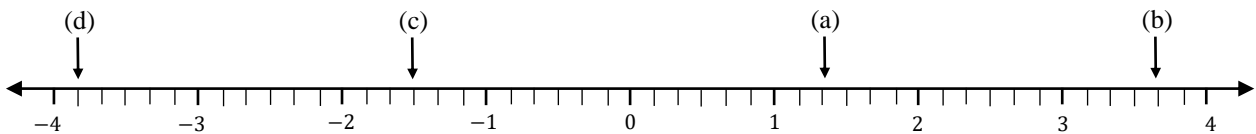
- (a) _____ (b) _____ (c) _____ (d) _____



Question 5

State which improper fraction has been labelled on the number line below.

- (a) _____ (b) _____ (c) _____ (d) _____



Question 6

Put the following in order from smallest to largest.

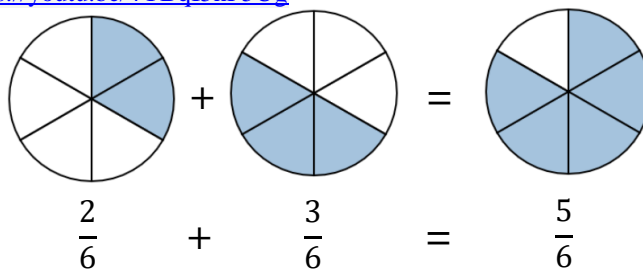
$$1\frac{5}{12}, \frac{4}{3}, 1\frac{7}{12}, 1\frac{1}{6}, \frac{3}{2}, 1\frac{2}{3}, \frac{5}{4}$$

Question 7

Jim and Jane purchase 2 pizzas. Each pizza has been cut into 8 pieces. Jim eats $\frac{5}{4}$ of a pizza and Jane eats what's left. How many slices did Jane eat?

5E Addition and Subtraction of Fractions <https://youtu.be/4YBqI5nF5Ug>

- You can only add/subtract fractions with the same denominator
- Add/subtract the numerators
- Denominator stays the same



Example 1 – Denominators are the same https://youtu.be/XjtzvQ_dCxE

Add/subtract the following fractions and express your solution in simplest form.

(a) $\frac{2}{5} + \frac{1}{5}$

(b) $\frac{5}{8} - \frac{3}{8}$

(c) $\frac{3}{4} + \frac{2}{4} + \frac{3}{4} - \frac{1}{4}$

Question 1

Add/subtract the following fractions and express your solution in simplest form.

(a) $\frac{1}{7} + \frac{3}{7}$

(b) $\frac{1}{4} + \frac{2}{4}$

(c) $\frac{5}{6} - \frac{4}{6}$

(d) $\frac{1}{9} + \frac{2}{9}$

(e) $\frac{6}{8} - \frac{2}{8}$

(f) $\frac{1}{10} + \frac{3}{10}$

(g) $\frac{5}{12} - \frac{2}{12}$

(h) $\frac{7}{15} - \frac{2}{15}$

(i) $\frac{9}{25} + \frac{6}{25}$

(j) $\frac{4}{16} + \frac{10}{16} - \frac{2}{16}$

(k) $\frac{6}{20} + \frac{10}{20} + \frac{8}{20}$

(l) $\frac{19}{28} + \frac{17}{28} - \frac{1}{28}$

Example 2 – Denominators are different https://youtu.be/qpJM_M-6atA

Add/subtract the following fractions and express your solution in simplest form.

(a) $\frac{1}{4} + \frac{5}{8}$

(b) $\frac{2}{3} - \frac{1}{9}$

(c) $\frac{8}{20} - \frac{1}{5}$

Question 2

Add/subtract the following fractions and express your solution in simplest form.

(a) $\frac{1}{5} + \frac{5}{10}$

(b) $\frac{5}{8} - \frac{1}{2}$

(c) $\frac{8}{12} + \frac{1}{4}$

(d) $\frac{3}{5} - \frac{3}{15}$

(e) $\frac{18}{20} - \frac{2}{5}$

(f) $\frac{4}{10} + \frac{6}{30}$

(g) $\frac{31}{60} - \frac{5}{12}$

(h) $\frac{7}{24} + \frac{3}{8}$

(i) $\frac{3}{7} + \frac{5}{35}$

Example 3 – Denominators are different (advanced) <https://youtu.be/j2nWOKzykLk>

Add/subtract the following fractions and express your solution in simplest form.

(a) $\frac{1}{2} + \frac{1}{3}$

(b) $\frac{8}{10} - \frac{2}{6}$

(c) $\frac{3}{4} + \frac{5}{6}$

Question 3

Add/subtract the following fractions and express your solution in simplest form.

(a) $\frac{1}{4} + \frac{1}{3}$

(b) $\frac{2}{3} - \frac{1}{2}$

(c) $\frac{2}{10} + \frac{3}{4}$

(d) $\frac{5}{6} - \frac{3}{9}$

(e) $\frac{3}{5} - \frac{2}{4}$

(f) $\frac{5}{12} + \frac{7}{8}$

(g) $\frac{6}{7} - \frac{3}{5}$

(h) $\frac{7}{10} + \frac{8}{9}$

(i) $\frac{2}{3} + \frac{5}{8}$

(j) $\frac{2}{15} + \frac{6}{20}$

(k) $\frac{8}{11} - \frac{5}{12}$

(l) $\frac{14}{20} - \frac{20}{50}$

Adding/Subtracting Mixed Numerals

To add/subtract mixed numerals you can either:

- 1) Convert the mixed numerals to improper fractions and then add/subtract them.
- 2) Add/subtract the whole numbers and fractions separately

Example 4 – Adding Mixed Numerals <https://youtu.be/rKFWtDQeDWo>

Add the following mixed numerals and express your solution in simplest form.

(a) $2\frac{3}{5} + 3\frac{1}{5}$

(b) $1\frac{7}{9} + \frac{2}{3}$

(c) $2\frac{5}{6} + 3\frac{3}{4}$

Question 4

Add the following mixed numerals and express your solution in simplest form.

(a) $2\frac{2}{7} + 1\frac{3}{7}$

(b) $5\frac{4}{6} + \frac{5}{6}$

(c) $3\frac{2}{3} + 5\frac{1}{6}$

(d) $\frac{3}{5} + 4\frac{8}{15}$

(e) $1\frac{12}{20} + 3\frac{3}{4}$

(f) $2\frac{1}{2} + 2\frac{2}{5}$

(g) $\frac{5}{8} + 4\frac{7}{12}$

(h) $1\frac{9}{10} + 6\frac{1}{4}$

(i) $7\frac{5}{9} + \frac{7}{12}$

Example 5 – Subtracting Mixed Numerals <https://youtu.be/0ISSwTcYxUQ>

Subtract the following mixed numerals and express your solution in simplest form.

(a) $4\frac{3}{5} - 3\frac{1}{5}$

(b) $2\frac{1}{4} - \frac{5}{8}$

(c) $5\frac{4}{9} - 3\frac{5}{6}$

Question 5

Subtract the following mixed numerals and express your solution in simplest form.

(a) $6\frac{5}{6} - 2\frac{3}{6}$

(b) $3\frac{1}{5} - \frac{3}{5}$

(c) $4\frac{1}{3} - 1\frac{2}{3}$

Question 5 continued

Subtract the following mixed numerals and express your solution in simplest form.

(d) $7\frac{1}{3} - 2\frac{2}{9}$

(e) $3\frac{7}{20} - 1\frac{3}{4}$

(f) $4\frac{1}{9} - 1\frac{10}{36}$

(g) $6\frac{1}{4} - 3\frac{1}{5}$

(h) $3\frac{2}{6} - \frac{7}{9}$

(i) $5\frac{3}{8} - 4\frac{4}{5}$

Question 6

Three friends share a chocolate bar. The bar of chocolate is cut into 20 evenly sized pieces. Abby ate $\frac{2}{5}$ of the chocolate and Bobby ate $\frac{3}{10}$ of the chocolate. If Cody ate the rest of the chocolate, how many of the 20 pieces did he eat?

Question 7

Terry is following a recipe and needs to measure a $\frac{3}{4}$ cup of milk but does not have the correct sized $\frac{3}{4}$ cup. He does have the following measuring instruments:

- $\frac{1}{2}$ of a cup
- $\frac{1}{3}$ of a cup
- 1 Tablespoon (equivalent to $\frac{1}{12}$ of a cup)

Explain how he could measure a $\frac{3}{4}$ cup of milk using these three instruments.

5F Multiplication of Fractions <https://youtu.be/SEbcarzug8c>

- Multiply the numerators
- Multiply the denominators
- Express your solution in simplest form

Example 1 https://youtu.be/YM2pHd_ciCA

Multiply the following fractions and express your solution in simplest form.

(a) $\frac{2}{3} \times \frac{2}{5}$

(b) $\frac{3}{8} \times \frac{4}{5}$

(c) $\frac{1}{9}$ of $\frac{3}{4}$

Question 1

Multiply the following fractions and express your solution in simplest form.

(a) $\frac{1}{4} \times \frac{3}{5}$

(b) $\frac{5}{7} \times \frac{2}{3}$

(c) $\frac{3}{8} \times \frac{1}{5}$

(d) $\frac{2}{3} \times \frac{1}{2}$

(e) $\frac{3}{5} \times \frac{1}{3}$

(f) $\frac{4}{5} \times \frac{5}{9}$

(g) $\frac{3}{4} \times \frac{2}{5}$

(h) $\frac{4}{9} \times \frac{3}{5}$

(i) $\frac{7}{10} \times \frac{5}{9}$

(j) $\frac{2}{7}$ of $\frac{7}{9}$

(k) $\frac{5}{12}$ of $\frac{8}{9}$

(l) $\frac{8}{10}$ of $\frac{10}{12}$

Example 2 – simplifying as you multiply <https://youtu.be/Y8thN0y2rDQ>

Multiply the following fractions and simplify by cancelling common factors.

(a) $\frac{3}{4} \times \frac{4}{5}$

(b) $\frac{8}{9} \times \frac{3}{4}$

(c) $\frac{8}{30}$ of $\frac{5}{12}$

Question 2

Multiply the following fractions and simplify by cancelling common factors.

(a) $\frac{2}{5} \times \frac{5}{7}$

(b) $\frac{3}{6} \times \frac{1}{3}$

(c) $\frac{4}{9} \times \frac{2}{4}$

(d) $\frac{3}{4} \times \frac{5}{6}$

(e) $\frac{5}{8} \times \frac{2}{10}$

(f) $\frac{2}{15}$ of $\frac{3}{4}$

(g) $\frac{1}{6} \times \frac{9}{5}$

(h) $\frac{2}{4}$ of $\frac{6}{7}$

(i) $\frac{3}{10}$ of $\frac{8}{9}$

(j) $\frac{5}{8}$ of $\frac{10}{15}$

(k) $\frac{7}{20}$ of $\frac{15}{14}$

(l) $\frac{15}{17} \times \frac{7}{35}$

Example 3 – multiplying by whole numbers <https://youtu.be/8DUCL5jNLLk>

Calculate the following and express your solution in simplest form:

(a) $\frac{2}{3} \times 12$

(b) 7 of $\frac{3}{4}$

(c) $\frac{4}{5}$ of 30 Apples

Question 3

Calculate the following and express your solution in simplest form:

(a) $\frac{3}{4} \times 12$

(b) $\frac{1}{3} \times 15$

(c) $\frac{3}{5} \times 20$

(d) $\frac{1}{2} \times 9$

(e) $15 \times \frac{2}{5}$

(f) $\frac{5}{6} \times 8$

(g) 14 of $\frac{3}{7}$

(h) $\frac{2}{9}$ of 15

(i) $\frac{3}{8}$ of 22

(j) $\frac{2}{11}$ of 33 bananas

(k) $\frac{3}{8}$ of 24 people

(l) $\frac{3}{5}$ of 25 pens

Example 4 – multiplying by mixed numerals https://youtu.be/AjFe-lGf1_Y

Calculate the following and express your solution in simplest form:

(a) $2\frac{1}{3} \times \frac{2}{5}$

(b) $\frac{9}{15}$ of $3\frac{3}{4}$

(c) $1\frac{3}{4} \times 2\frac{2}{3}$

Question 4

Multiply the following improper fractions and give your solution as a simplified mixed numeral.

(a) $1\frac{2}{3} \times \frac{1}{2}$

(b) $\frac{1}{4}$ of $1\frac{2}{3}$

(c) $3\frac{1}{2} \times 1\frac{4}{5}$

Question 4 continued

Multiply the following improper fractions and give your solution as a simplified mixed numeral.

(d) $2\frac{1}{4} \times \frac{2}{9}$

(e) $2\frac{2}{5} \times 1\frac{3}{12}$

(f) $1\frac{1}{4}$ of $1\frac{2}{10}$

(g) $5\frac{1}{3} \times 1\frac{3}{12}$

(h) $\frac{2}{7} \times 4\frac{3}{8}$

(i) $1\frac{2}{7} \times 2\frac{2}{6}$

Question 5

The population of Australia is 2 400 000. $\frac{2}{100}$ Australians have green eyes. How many Australians have green eyes?

Question 6

Jane receives a wage of \$820 every week. $\frac{2}{5}$ Of her pay is spent on rent. How much is her rent?

Question 7

A cake recipe uses $1\frac{3}{4}$ cups of flour. What total amount of flour is required to make 5 cakes?

Question 8

$\frac{3}{5}$ of the students at Grammar College are girls. $\frac{1}{5}$ of the girls at Grammar college are in year 7. What fraction of the students at Grammar College are female and in year 7?

5G Division of Fractions

- Find the reciprocal of the second fraction (flip it)
- Multiply the fractions
- Express your solution in simplest form

Example 1 <https://youtu.be/wqTFUhrhFUw>

Find the reciprocal for each of the following:

(a) $\frac{3}{5}$

(b) $\frac{1}{6}$

(c) 4

(d) $2\frac{3}{4}$

Question 1

Find the reciprocal for each of the following:

(a) $\frac{2}{3}$

(b) $\frac{4}{5}$

(c) $\frac{7}{4}$

(d) $\frac{1}{4}$

(e) $\frac{1}{8}$

(f) 3

(g) 2

(h) $1\frac{2}{5}$

(i) $2\frac{1}{3}$

(j) $4\frac{3}{5}$

(k) 11

(l) 1

Example 2 <https://youtu.be/AQ-IRZNia7M>

Calculate the following:

(a) $\frac{2}{3} \div \frac{3}{4}$

(b) $\frac{3}{5} \div \frac{4}{6}$

(c) $\frac{4}{7} \div \frac{5}{7}$

(d) $\frac{5}{6} \div \frac{1}{3}$

The following video will explain why multiplying by the reciprocal works <https://youtu.be/nvFDeLXL1WM>

Question 2

Calculate the following:

(a) $\frac{2}{5} \div \frac{3}{7}$

(b) $\frac{1}{6} \div \frac{2}{5}$

(c) $\frac{3}{8} \div \frac{2}{4}$

(d) $\frac{5}{9} \div \frac{5}{8}$

(e) $\frac{3}{6} \div \frac{4}{5}$

(f) $\frac{3}{7} \div \frac{1}{3}$

(g) $\frac{4}{9} \div \frac{4}{6}$

(h) $\frac{5}{12} \div \frac{4}{8}$

(i) $\frac{5}{9} \div \frac{2}{6}$

(j) $\frac{3}{8} \div \frac{3}{8}$

(k) $\frac{6}{10} \div \frac{3}{5}$

(l) $\frac{10}{11} \div \frac{10}{22}$

(m) $\frac{6}{7} \div \frac{1}{5}$

(n) $\frac{9}{15} \div \frac{7}{10}$

Example 3 <https://youtu.be/Tf6xHrfgYaY>

Calculate the following:

(a) $\frac{2}{3} \div 5$

(b) $3 \div \frac{5}{6}$

(c) $4 \div \frac{1}{5}$

(d) $21 \div \frac{7}{5}$

Question 3

Calculate the following:

(a) $\frac{4}{5} \div 3$

(b) $\frac{1}{4} \div 6$

(c) $\frac{2}{3} \div 4$

(d) $\frac{5}{6} \div 10$

(e) $4 \div \frac{3}{5}$

(f) $8 \div \frac{3}{4}$

(g) $6 \div \frac{1}{2}$

(h) $\frac{8}{12} \div 6$

(i) $4 \div \frac{2}{5}$

(j) $30 \div \frac{5}{3}$

(k) $\frac{15}{6} \div 10$

(l) $42 \div \frac{7}{5}$

Example 4 <https://youtu.be/6v66li5-I9E>

Calculate the following:

(a) $1\frac{2}{3} \div \frac{9}{5}$

(b) $\frac{10}{4} \div 3\frac{3}{4}$

(c) $3\frac{1}{3} \div 1\frac{3}{7}$

(d) $3\frac{3}{5} \div 1\frac{5}{7}$

Question 4

Calculate the following:

(a) $\frac{1}{5} \div 1\frac{1}{2}$

(b) $1\frac{1}{5} \div \frac{3}{2}$

(c) $1\frac{1}{3} \div 2\frac{1}{2}$

(d) $2\frac{1}{3} \div \frac{11}{3}$

Question 4 continued

Calculate the following:

(e) $3\frac{1}{3} \div 2\frac{1}{3}$

(f) $\frac{5}{7} \div 3\frac{2}{7}$

(g) $2\frac{4}{9} \div 2\frac{3}{4}$

(h) $3\frac{2}{5} \div \frac{1}{10}$

(i) $3\frac{5}{9} \div 8$

(j) $3\frac{1}{5} \div 5\frac{2}{6}$

(k) $13\frac{2}{6} \div 16\frac{2}{3}$

(l) $7\frac{1}{5} \div \frac{3}{10}$

Question 5

Harry finds $\frac{3}{4}$ of a cake in the fridge and decided to share it equally amongst a group of 5 people. What fraction of cake will each person receive?

Question 6

A piece of timber is $8\frac{1}{6}$ metres long. A carpenter would like to cut it into pieces of length $1\frac{1}{6}$ metres long. How many pieces of timber will the carpenter have once they have finished the cuts?

Question 7

Jasmine takes $2\frac{1}{4}$ minutes to solve a Rubik's cube. How many times can she solve the Rubik's cube in 21 minutes?

Question 8

Sometimes we get a fraction over another fraction as pictured below. Represent this as a single fraction in simplest form.

$$\frac{\frac{3}{4}}{\frac{7}{8}}$$

5H Complex Fraction Operations (Advanced Students Only) <https://youtu.be/zVNfitf7r3k>

The dot points below are a summary of what we learned in the integers topic. The integers topic taught you how to perform operations on positive and negative numbers. If you are unfamiliar with the integers topic, then you need to go back and complete that course before attempting this topic.

- When adding or subtracting integers (positive and negative numbers) refer to the number line below. For example: $-3 + 5$ can be calculated as shown below.



- When adding or subtracting negative numbers remember that:
 - Subtracting a negative is the same as adding e.g. $-2 - (-4) = -2 + 4 = 2$
 - Adding a negative is the same as subtracting e.g. $3 + (-5) = 3 - 5 = -2$
- When multiplying/dividing integers remember that:
 - Two negatives make a positive e.g. $-3 \times (-2) = 6$
 - One negative and one positive make a negative e.g. $10 \div (-5) = -2$
- Remember to always follow the order of operations when performing multiple operations.

B I D M A S
 () $3^2 \div \times + -$

Example 1 <https://youtu.be/eZdjgUc1es4>

Calculate the following:

(a) $-\frac{1}{5} + \frac{3}{5}$

(b) $\frac{1}{3} + \left(-\frac{5}{6}\right)$

(c) $-1\frac{3}{4} - 2\frac{1}{2}$

(d) $-\frac{2}{3} - \left(-2\frac{3}{4}\right)$

Question 1

Calculate the following:

(a) $\frac{2}{7} - \frac{4}{7}$

(b) $-\frac{1}{8} - \left(-\frac{7}{8}\right)$

(c) $-\frac{3}{10} - \frac{3}{5}$

(d) $\frac{1}{12} + \left(-\frac{3}{4}\right)$

Question 1 continued

Calculate the following:

(e) $-\frac{3}{4} + \frac{2}{5}$

(f) $1\frac{5}{6} - \left(-\frac{11}{18}\right)$

(g) $2\frac{7}{8} + \left(-\frac{7}{4}\right)$

(h) $-\frac{5}{6} + 2\frac{3}{8}$

(i) $-3\frac{9}{10} - \left(-1\frac{8}{15}\right)$

(j) $-1\frac{5}{12} + \left(-2\frac{2}{9}\right)$

Example 2 <https://youtu.be/YgTiEa1-mW4>

Calculate the following:

(a) $-\frac{2}{3} \times \frac{4}{5}$

(b) $-\frac{1}{5} \div \left(-\frac{2}{4}\right)$

(c) $1\frac{4}{7} \times \left(-\frac{7}{4}\right)$

(d) $-3\frac{4}{7} \div \left(-3\frac{3}{4}\right)$

Question 2

Calculate the following:

(a) $-\frac{3}{4} \times \frac{1}{5}$

(b) $-\frac{2}{3} \times \left(-\frac{3}{5}\right)$

(c) $-\frac{3}{5} \div \frac{4}{3}$

(d) $\frac{4}{7} \div \left(-\frac{8}{7}\right)$

(e) $\frac{10}{12} \times \left(-\frac{14}{15}\right)$

(f) $-\frac{8}{12} \div \left(-\frac{24}{4}\right)$

Question 2 continued

Calculate the following:

(g) $-1\frac{3}{5} \times \frac{1}{4}$

(h) $-\frac{2}{3} \div \left(-2\frac{1}{3}\right)$

(i) $1\frac{1}{6} \div \left(-4\frac{2}{3}\right)$

(j) $\frac{10}{27} \times \left(-5\frac{5}{8}\right)$

(k) $-4\frac{1}{6} \times \left(-2\frac{2}{15}\right)$

(l) $-9\frac{3}{4} \div \left(-1\frac{5}{8}\right)$

Example 3 <https://youtu.be/URiTag6bN6g>

Calculate the questions below by following the order of operations.

(a) $\frac{1}{5} - \frac{3}{4} \times \left(-\frac{2}{5}\right)$

(b) $\frac{1}{2} - \left(\frac{2}{3} - \frac{5}{6}\right) \div \frac{5}{6}$

Question 3

Calculate the questions below by following the order of operations.

(a) $\frac{2}{3} - \frac{5}{6} \div \frac{1}{3}$

(b) $-\frac{4}{5} + \frac{2}{3} \times \frac{7}{10} - \frac{1}{10}$

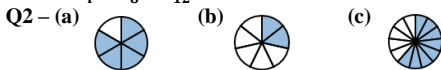
(c) $\frac{1}{2} - \left(\frac{1}{2} + \frac{2}{5}\right) \times \frac{2}{3}$

(d) $\frac{2}{3} \div \frac{5}{6} + \left(\frac{1}{4} - 1\frac{3}{8}\right) \times \frac{16}{15}$

Solutions

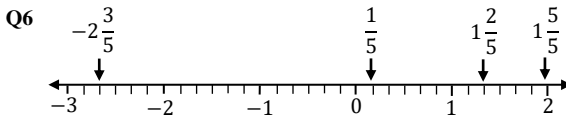
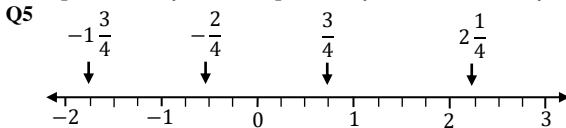
Chapter 5A

Q1 - (a) $\frac{1}{4}$ (b) $\frac{3}{8}$ (c) $\frac{7}{12}$



Q3 - (a) True (b) False (c) True

Q4 - (a) one-seventh (b) three-eighths (c) two-quarters (d) four-tenths
(e) one-ninth (f) three-fifths (g) seven-fifteenths (h) one-third
(i) one-half (j) one-twelfth (k) six-seventeenths (l) nine-twentieths
(m) fifteen-thirtieths (n) twenty-hundredths (o) eight-forty-fifths
(p) seven-forty-second (q) one-sixty-third (r) two-ninety-firsts



Q7 - (a) $\frac{1}{3}$ (b) $2\frac{2}{3}$ (c) $-\frac{2}{3}$ (d) $-3\frac{1}{3}$

Q8 - (a) $\frac{4}{6}$ (b) $3\frac{1}{6}$ (c) $-1\frac{2}{6}$ (d) $-3\frac{5}{6}$

Q9 - (a) > (b) < (c) > (d) > (e) < (f) >

Q10 - (a) $-2\frac{5}{8}$, $-\frac{3}{8}$, $-\frac{1}{8}$, $\frac{1}{8}$, $\frac{4}{8}$, $\frac{7}{8}$, $3\frac{2}{8}$ (b) $-6\frac{1}{9}$, $-3\frac{5}{9}$, $-\frac{4}{9}$, $-\frac{2}{9}$, $\frac{5}{9}$, $\frac{7}{9}$, $2\frac{8}{9}$

Q11 - The fraction has not been divided into equal parts

Chapter 5B

Q1 - (a) $\frac{2}{6}$, $\frac{3}{9}$, $\frac{4}{12}$, ... (b) $\frac{6}{8}$, $\frac{9}{12}$, $\frac{12}{16}$, ... (c) $\frac{8}{10}$, $\frac{12}{15}$, $\frac{16}{20}$, ... (d) $\frac{10}{18}$, $\frac{15}{27}$, $\frac{20}{36}$, ...
(e) $\frac{4}{14}$, $\frac{6}{21}$, $\frac{8}{28}$, ... (f) $\frac{14}{16}$, $\frac{21}{24}$, $\frac{28}{32}$, ...

Q2 - (a) 2 (b) 6 (c) 21 (d) 20 (e) 20 (f) 18 (g) 45 (h) 35

Q3 - (a) 2 (b) 2 (c) 5 (d) 4 (e) 12 (f) 3 (g) 8 (h) 3

Q4 - (a) $\times 3$ (b) $\times 3$ (c) $\times 4$ (d) $\times 6$

Q5 - (a) $\div 2$ (b) $\div 3$ (c) $\div 5$ (d) $\div 16$

Q6 - $\frac{6}{10}$, $\frac{12}{20}$, $\frac{30}{50}$, $\frac{15}{25}$

Q7 - $\frac{12}{12}$

Q8 - (a) < (b) > (c) = (d) > (e) > (f) >

Q9 - $\frac{7}{9}$

Chapter 5C

Q1 - (a) $\frac{4}{5}$ (b) $\frac{2}{3}$ (c) $\frac{3}{4}$ (d) $\frac{3}{5}$ (e) $\frac{1}{3}$ (f) $\frac{2}{7}$ (g) $\frac{8}{11}$ (h) $\frac{1}{3}$ (i) $\frac{1}{2}$ (j) $\frac{5}{7}$ (k) $\frac{2}{3}$ (l) $\frac{7}{8}$ (m) $1\frac{3}{4}$
(n) $5\frac{2}{3}$ (o) $3\frac{5}{7}$ (p) $2\frac{3}{4}$

Q2 - (a) $\frac{3}{4}$ (b) $\frac{5}{7}$ (c) $\frac{4}{9}$ (d) $\frac{3}{7}$ (e) $\frac{3}{4}$ (f) $\frac{4}{5}$ (g) $\frac{5}{9}$ (h) $\frac{3}{5}$ (i) $\frac{7}{10}$ (j) $\frac{4}{7}$ (k) $\frac{1}{6}$ (l) $\frac{7}{19}$

Q3 - (a) $\frac{2}{5}$ (b) $\frac{2}{9}$ (c) $\frac{1}{4}$ (d) $\frac{2}{3}$ (e) $\frac{7}{10}$ (f) $\frac{2}{3}$ (g) $\frac{5}{7}$ (h) $\frac{4}{7}$

Q4 - (a) 2 (b) 3 (c) 1

Q5 - (a) $\frac{5}{32}$ (b) $\frac{1}{4}$ (c) $\frac{5}{8}$

Q6 - (a) no (b) yes (c) no

Chapter 5D

Q1 - (a) $\frac{7}{3}$ (b) $\frac{7}{5}$ (c) $\frac{15}{4}$ (d) $\frac{14}{3}$ (e) $\frac{11}{2}$ (f) $\frac{10}{7}$ (g) $\frac{17}{6}$ (h) $\frac{33}{10}$ (i) $\frac{37}{8}$ (j) $\frac{28}{9}$ (k) $\frac{45}{7}$ (l) $\frac{93}{11}$

Q2 - (a) $2\frac{1}{3}$ (b) $2\frac{1}{4}$ (c) $4\frac{1}{2}$ (d) $3\frac{1}{4}$ (e) $1\frac{2}{5}$ (f) $1\frac{5}{6}$ (g) $2\frac{6}{7}$ (h) $2\frac{4}{9}$ (i) $1\frac{7}{8}$ (j) $3\frac{1}{11}$
(k) $4\frac{4}{5}$ (l) $4\frac{6}{7}$

Q3 - (a) $3\frac{1}{2}$ (b) $3\frac{1}{4}$ (c) $2\frac{2}{5}$ (d) $2\frac{2}{3}$ (e) $2\frac{1}{2}$ (f) $2\frac{1}{5}$ (g) $2\frac{1}{7}$ (h) $2\frac{1}{8}$

Q4 - (a) $\frac{4}{3}$ (b) $\frac{8}{3}$ (c) $\frac{13}{3}$ (d) $\frac{20}{3}$

Q5 - (a) $\frac{8}{6}$ or $\frac{4}{3}$ (b) $\frac{22}{6}$ or $\frac{11}{3}$ (c) $-\frac{9}{6}$ or $-\frac{3}{2}$ (d) $-\frac{23}{6}$

Q6 - $1\frac{1}{6}$, $\frac{5}{4}$, $\frac{4}{3}$, $1\frac{5}{12}$, $\frac{3}{2}$, $1\frac{7}{12}$, $1\frac{2}{3}$

Q7 - 6 slices

Chapter 5E

Q1 - (a) $\frac{4}{7}$ (b) $\frac{3}{4}$ (c) $\frac{1}{6}$ (d) $\frac{3}{9} = \frac{1}{3}$ (e) $\frac{4}{8} = \frac{1}{2}$ (f) $\frac{4}{10} = \frac{2}{5}$ (g) $\frac{3}{12} = \frac{1}{4}$ (h) $\frac{5}{15} = \frac{1}{3}$

(i) $\frac{15}{25} = \frac{3}{5}$ (j) $\frac{14}{16} = \frac{7}{8}$ (k) $\frac{24}{20} = 1\frac{2}{5}$ (l) $\frac{35}{28} = 1\frac{1}{4}$

Q2 - (a) $\frac{7}{10}$ (b) $\frac{1}{8}$ (c) $\frac{11}{12}$ (d) $\frac{6}{15} = \frac{2}{5}$ (e) $\frac{10}{20} = \frac{1}{2}$ (f) $\frac{18}{30} = \frac{3}{5}$ (g) $\frac{6}{60} = \frac{1}{10}$ (h) $\frac{16}{24} = \frac{2}{3}$

(i) $\frac{20}{35} = \frac{4}{7}$

Q3 - (a) $\frac{1}{12}$ (b) $\frac{1}{6}$ (c) $\frac{19}{20}$ (d) $\frac{9}{18} = \frac{1}{2}$ (e) $\frac{2}{20} = \frac{1}{10}$ (f) $\frac{31}{24} = 1\frac{7}{24}$ (g) $\frac{9}{35}$

(h) $\frac{143}{90} = 1\frac{53}{90}$ (i) $\frac{31}{24} = 1\frac{7}{24}$ (j) $\frac{26}{60} = \frac{13}{30}$ (k) $\frac{41}{132}$ (l) $\frac{30}{100} = \frac{3}{10}$

Q4 - (a) $3\frac{5}{7}$ (b) $6\frac{3}{6} = 6\frac{1}{2}$ (c) $8\frac{5}{6}$ (d) $5\frac{2}{15}$ (e) $5\frac{7}{20}$ (f) $4\frac{9}{10}$ (g) $5\frac{5}{24}$ (h) $8\frac{3}{20}$

(i) $8\frac{5}{36}$

Q5 - (a) $4\frac{1}{6} = 4\frac{1}{3}$ (b) $2\frac{3}{5}$ (c) $2\frac{2}{3}$ (d) $7\frac{1}{9}$ (e) $1\frac{12}{20} = 1\frac{3}{5}$ (f) $2\frac{30}{36} = 2\frac{5}{6}$ (g) $3\frac{1}{20}$

(h) $2\frac{10}{18} = 2\frac{5}{9}$ (i) $\frac{23}{40}$

Q6 - 6 pieces

Q7 - just add a $\frac{1}{2}$ cup to a $\frac{1}{3}$ cup of milk and take away one tablespoon of milk
 $\frac{1}{2} + \frac{1}{3} - \frac{1}{12} = \frac{6}{12} + \frac{4}{12} - \frac{1}{12} = \frac{9}{12} = \frac{3}{4}$

Chapter 5F

Q1 - (a) $\frac{3}{20}$ (b) $\frac{10}{21}$ (c) $\frac{3}{40}$ (d) $\frac{2}{6} = \frac{1}{3}$ (e) $\frac{3}{15} = \frac{1}{5}$ (f) $\frac{20}{45} = \frac{4}{9}$ (g) $\frac{6}{20} = \frac{3}{10}$ (h) $\frac{12}{45} = \frac{4}{15}$

(i) $\frac{35}{90} = \frac{7}{18}$ (j) $\frac{14}{63} = \frac{2}{9}$ (k) $\frac{40}{108} = \frac{10}{27}$ (l) $\frac{80}{120} = \frac{2}{3}$

Q2 - (a) $\frac{2}{7}$ (b) $\frac{1}{6}$ (c) $\frac{2}{9}$ (d) $\frac{5}{8}$ (e) $\frac{1}{10}$ (f) $\frac{1}{10}$ (g) $\frac{3}{10}$ (h) $\frac{6}{14}$ (i) $\frac{4}{15}$ (j) $\frac{5}{12}$ (k) $\frac{3}{8}$ (l) $\frac{3}{17}$

Q3 - (a) 9 (b) 5 (c) 12 (d) $4\frac{1}{2}$ (e) 6 (f) $6\frac{2}{3}$ (g) 6 (h) $3\frac{1}{3}$ (i) $8\frac{1}{4}$

(j) 6 bananas (k) 9 people (l) 15 pens

Q4 - (a) $\frac{5}{6}$ (b) $\frac{5}{12}$ (c) $6\frac{3}{10}$ (d) $\frac{1}{2}$ (e) 3 (f) $1\frac{1}{2}$ (g) $6\frac{2}{3}$ (h) $1\frac{1}{4}$ (i) 3

Q5 - 48 000 people

Q6 - \$328

Q7 - $8\frac{3}{4}$ cup of flour

Q8 - $\frac{3}{25}$ of the students are female and in year 7

Chapter 5G

Q1 - (a) $\frac{3}{2}$ (b) $\frac{5}{4}$ (c) $\frac{4}{7}$ (d) $\frac{4}{1} = 4$ (e) $\frac{8}{1} = 8$ (f) $\frac{1}{3}$ (g) $\frac{1}{2}$ (h) $\frac{5}{7}$ (i) $\frac{3}{7}$ (j) $\frac{5}{23}$ (k) $\frac{1}{11}$
(l) $\frac{1}{1} = 1$

Q2 - (a) $\frac{14}{15}$ (b) $\frac{5}{12}$ (c) $\frac{12}{16} = \frac{3}{4}$ (d) $\frac{40}{45} = \frac{8}{9}$ (e) $\frac{15}{24} = \frac{5}{8}$ (f) $\frac{9}{7} = 1\frac{2}{7}$ (g) $\frac{24}{36} = \frac{2}{3}$

(h) $\frac{40}{48} = \frac{5}{6}$ (i) $\frac{30}{18} = 1\frac{2}{3}$ (j) $\frac{24}{24} = 1$ (k) $\frac{30}{30} = 1$ (l) $\frac{220}{110} = 2$ (m) $\frac{30}{7} = 4\frac{2}{7}$

(n) $\frac{90}{105} = \frac{6}{7}$

Q3 - (a) $\frac{4}{15}$ (b) $\frac{1}{12}$ (c) $\frac{2}{6} = \frac{1}{3}$ (d) $\frac{5}{60} = \frac{1}{12}$ (e) $\frac{20}{30} = \frac{2}{3}$ (f) $\frac{32}{10} = 3\frac{2}{5}$ (g) $\frac{15}{60} = \frac{1}{4}$ (h) $\frac{210}{7} = 30$

(i) $\frac{12}{72} = \frac{1}{6}$ (j) $\frac{8}{9} = \frac{1}{1}$ (k) $\frac{20}{10} = 2$ (l) $\frac{30}{60} = \frac{1}{2}$ (m) $\frac{210}{7} = 30$

Q4 - (a) $\frac{2}{15}$ (b) $\frac{12}{15} = \frac{4}{5}$ (c) $\frac{8}{15}$ (d) $\frac{21}{33} = \frac{7}{11}$ (e) $\frac{5}{30} = \frac{1}{6}$ (f) $\frac{35}{60} = \frac{7}{12}$ (g) $\frac{161}{23} = 7$

(h) $\frac{88}{99} = \frac{8}{9}$ (i) $\frac{170}{5} = 34$ (j) $\frac{32}{72} = \frac{4}{9}$ (k) $\frac{96}{160} = \frac{3}{5}$ (l) $\frac{240}{300} = \frac{4}{5}$ (m) $\frac{360}{15} = 24$

Q5 - $\frac{3}{20}$

Q6 - $\frac{294}{242} = \frac{49}{77} = \frac{7}{11}$

Q7 - $\frac{84}{9} = 9\frac{1}{3}$. Jasmine would only solve it 9 times in 21 minutes.

Q8 - $\frac{3}{4} \div \frac{7}{8} = \frac{3}{4} \times \frac{8}{7} = \frac{24}{28} = \frac{6}{7}$

Chapter 5H

Q1 - (a) $-\frac{2}{7}$ (b) $\frac{6}{8} = \frac{3}{4}$ (c) $-\frac{9}{10}$ (d) $-\frac{8}{12} = -\frac{2}{3}$ (e) $-\frac{7}{20}$ (f) $\frac{44}{18} = 2\frac{8}{9} = 2\frac{4}{9}$

(g) $\frac{9}{8} = 1\frac{1}{8}$ (h) $\frac{37}{24} = 1\frac{13}{24}$ (i) $-\frac{71}{30} = -2\frac{11}{30}$ (j) $-\frac{131}{36} = -3\frac{23}{36}$

Q2 - (a) $-\frac{3}{20}$ (b) $\frac{6}{15} = \frac{2}{5}$ (c) $-\frac{9}{20}$ (d) $-\frac{4}{20} = -\frac{1}{5}$ (e) $-\frac{140}{180} = -\frac{7}{9}$

(f) $\frac{32}{288} = \frac{1}{9}$ (g) $-\frac{8}{20} = -\frac{2}{5}$ (h) $-\frac{6}{21} = -\frac{2}{7}$ (i) $-\frac{21}{84} = -\frac{1}{4}$

(j) $-\frac{450}{216} = -\frac{25}{12} = -2\frac{1}{12}$ (k) $\frac{800}{90} = \frac{80}{9} = 8\frac{8}{9}$ (l) $\frac{312}{52} = 6$

Q3 - (a) $-\frac{11}{6}$ (b) $-\frac{13}{30}$ (c) $-\frac{1}{10}$ (d) $-\frac{2}{5}$