



Name:.....

MEP: Demonstration Project

UNIT 17 *Arithmetic: Decimals, Fractions and Percentages*

Extra Exercises 17.1

1. Write these decimals as fractions in their simplest form:

- (a) 0.6 (b) 0.28 (c) 0.36
(d) 0.011 (e) 0.004 (f) 0.009
(g) 0.72 (h) 0.75 (i) 0.62
(j) 0.04 (k) 0.14 (l) 0.082

2. Calculate the answers to these problems, giving your answers as decimals *and* fractions:

- (a) $0.7 + 0.02$ (b) $0.9 - 0.5$ (c) $0.14 + 0.69$
(d) $0.72 - 0.41$ (e) $0.4 + 0.02$ (f) $0.5 - 0.12$

3. Write each list of numbers in *increasing* order:

- (a) 0.16, 0.1, 0.6, 0.61, 0.106, 0.601
(b) 0.7, 0.71, 0.17, 0.107, 0.701
(c) 0.32, 0.23, 0.203, 0.302, 0.2
(d) 0.15, 0.1, 0.5, 0.501, 0.105, 0.2
(e) 0.4, 0.401, 0.104, 0.34, 0.43

UNIT 17 *Arithmetic: Decimals,
Fractions and Percentages***Extra Exercises 17.2**

1. Write these fractions as decimals:

(a) $\frac{8}{10}$ (b) $\frac{22}{100}$ (c) $\frac{4}{1000}$

(d) $\frac{16}{1000}$ (e) $\frac{3}{100}$ (f) $\frac{142}{1000}$

2. Determine the missing numbers *and* then write each fraction as a decimal:

(a) $\frac{2}{5} = \frac{?}{10}$ (b) $\frac{3}{25} = \frac{?}{100}$ (c) $\frac{6}{50} = \frac{?}{100}$

(d) $\frac{7}{250} = \frac{?}{1000}$ (e) $\frac{3}{8} = \frac{?}{1000}$ (f) $\frac{17}{200} = \frac{?}{1000}$

3. Write these fractions as decimals:

(a) $\frac{3}{5}$ (b) $\frac{9}{50}$ (c) $\frac{11}{20}$

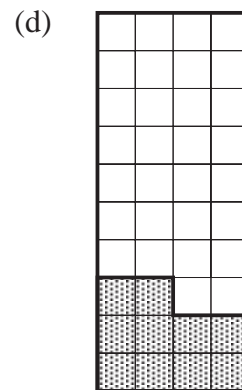
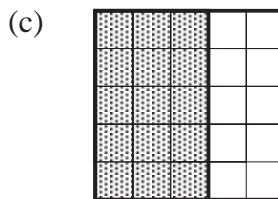
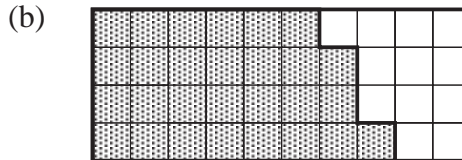
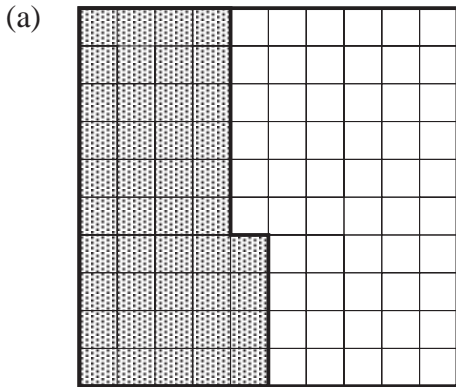
(d) $\frac{6}{25}$ (e) $\frac{19}{20}$ (f) $\frac{3}{40}$

(g) $\frac{11}{125}$ (h) $\frac{16}{25}$ (i) $\frac{51}{250}$

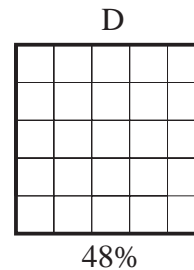
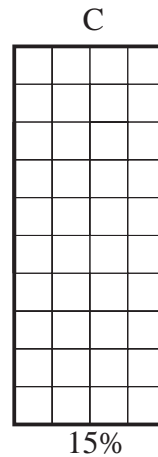
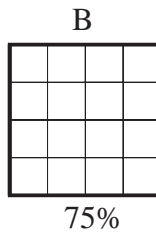
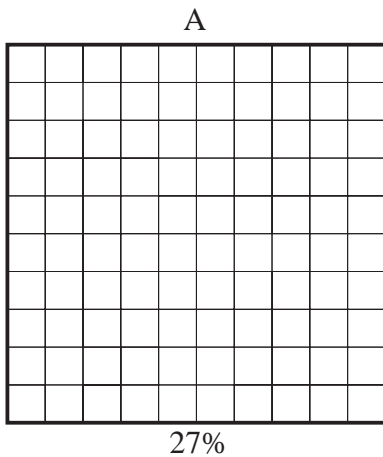
UNIT 17 *Arithmetic: Decimals, Fractions and Percentages*

Extra Exercises 17.3

1. What percentage of each of the following shapes is shaded:



2. (a) Copy each shape below and shade the stated percentage:



(b) For each shape, state what percentage is *not* shaded.

3. Calculate:

(a) 50% of £98

(b) 30% of 60 m

(c) 15% of £200

(d) 5% of £5

(e) 16% of £20

(f) 30% of 40 kg

UNIT 17 *Arithmetic: Decimals,
Fractions and Percentages***Extra Exercises 17.4**

1. Write these percentages as fractions in their simplest form:

(a) 22% (b) 44% (c) 58%

(d) 7% (e) 8% (f) 60%

(g) 25% (h) 90% (i) 80%

2. Write these fractions as percentages:

(a) $\frac{11}{100}$ (b) $\frac{14}{20}$ (c) $\frac{6}{25}$

(d) $\frac{7}{50}$ (e) $\frac{14}{25}$ (f) $\frac{17}{20}$

3. Each of the 25 children in a class was asked to state their favourite subject. The results are listed below:

<i>Maths</i>	8
<i>English</i>	2
<i>P.E.</i>	10
<i>Science</i>	1
<i>Art</i>	4

Write down the percentage of the children in the class that chose each subject.

4. There are 20 cars in a car park; 7 of these cars are red. What percentage of the cars in the car park is red?

5. $\frac{17}{20}$ of the children in a class can ride a bike. What percentage of the children in the class *cannot* ride a bike?

UNIT 18 *Quantitative Data***Extra Exercises 18.1**

1. Mr Bryant keeps a record of the number of Year 7 pupils absent each day over a 6-week period; his records are shown below:

3	1	0	2	7	3
2	4	3	2	5	4
0	0	2	3	4	5
3	2	1	5	4	1
3	1	3	3	2	2

- (a) Draw and complete a tally chart for these data.
- (b) Draw a vertical line diagram for these data.
- (c) What is the most common number of absent pupils?
2. A taxi driver writes down the number of times he has to stop at red traffic lights on all the journeys he makes one day; these are listed below:

4	3	7	6	2	1	1	2
3	1	3	6	4	3	5	2
1	1	2	3	6	2	1	4

- (a) Draw and complete a tally chart for these data.
- (b) Draw a vertical line diagram for these data.
- (c) How many journeys did the taxi driver make that day?
- (d) What was the most common number of red lights on these journeys?
- (e) How many times in total did he stop at red traffic lights?

UNIT 18 *Quantitative Data***Extra Exercises 18.2**

1. Write down the *mean*, *median* and *mode* of each of the following sets of data:

(a) 7 7 8 3 9

(b) 6 4 3 2 5 6 3 6 6 8 6

(c) 9 4 3 5 5 6 7 10

(d) 3 2 2 2 3 4 5 7 9 2 11 10

2. During a week in January the number of children absent from class 7G was recorded; these numbers are given below:

0 2 1 0 5

- (a) Write down the *mean*, *median* and *mode* of these data.
(b) Which of these averages gives the *best* impression of the class?
(c) Which of these averages gives the *worst* impression of the class?
3. The numbers of goals scored by a school hockey team in their matches are listed below:

6 1 0 2 2 3 4 0 1 1

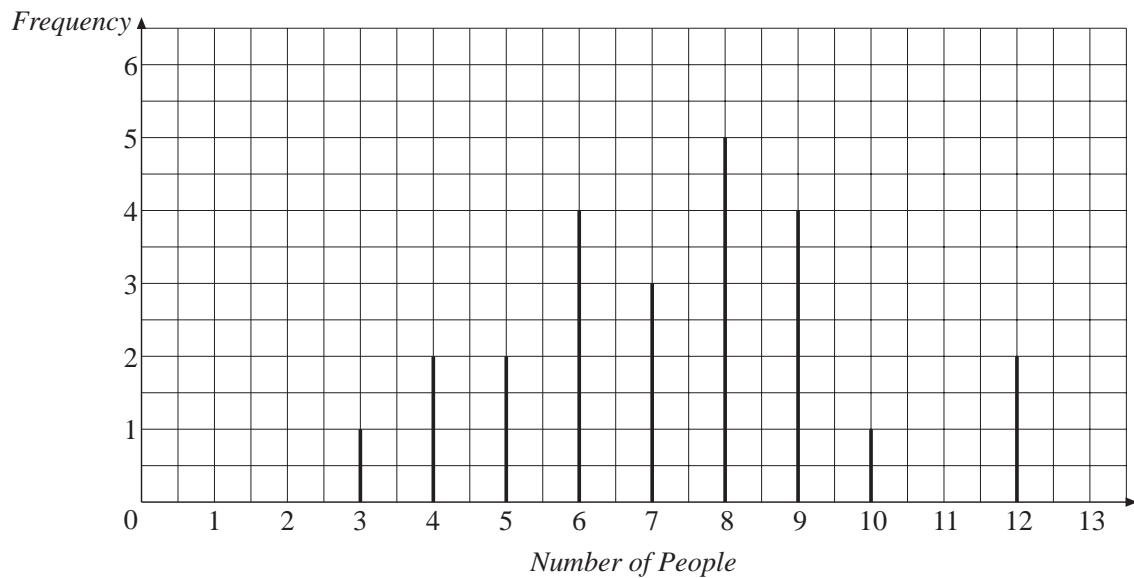
- (a) Write down the *mean*, *median* and *mode* of these data.
(b) The team coach wants to convince the headteacher that the hockey team are doing really well. Which average should she use?
(c) The coach from another team wants to convince his team that their match against the school team will be easy. Which average should he use?

UNIT 18 *Quantitative Data***Extra Exercises 18.3**

1. Determine the *range* of each of these sets of data:
 - (a) 3 4 6 3 7 8 2 12
 - (b) 16 19 18 21 32 17 49 11
 - (c) 16 22 32 104 66 92 74 55
 - (d) 121 152 163 168 120 139 149 157

2. The *range* of a set of four numbers is 9. If three of the numbers are 18, 22 and 21, what could be the fourth number?

3. Determine the *range* of the data illustrated in this vertical line diagram:



UNIT 18 *Quantitative Data*

Extra Exercises 18.4

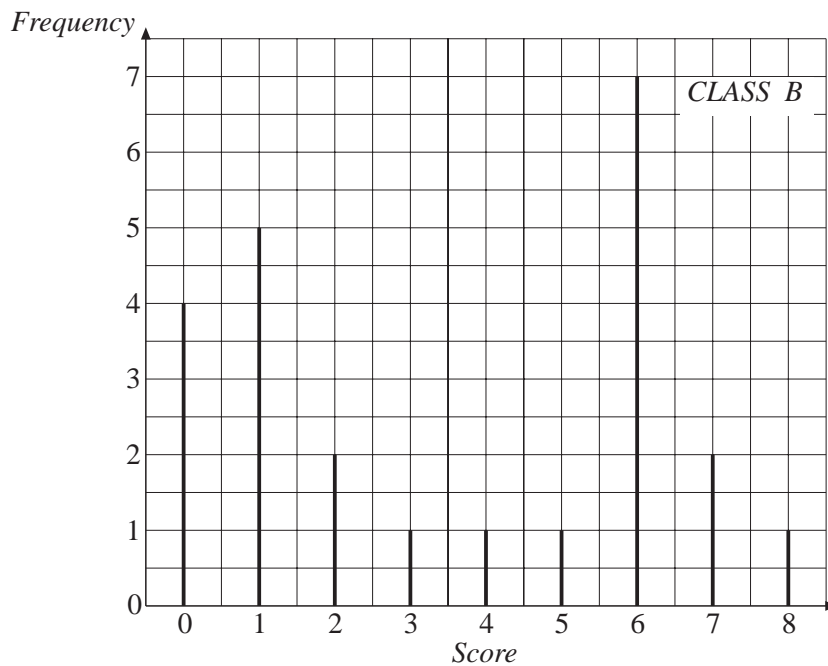
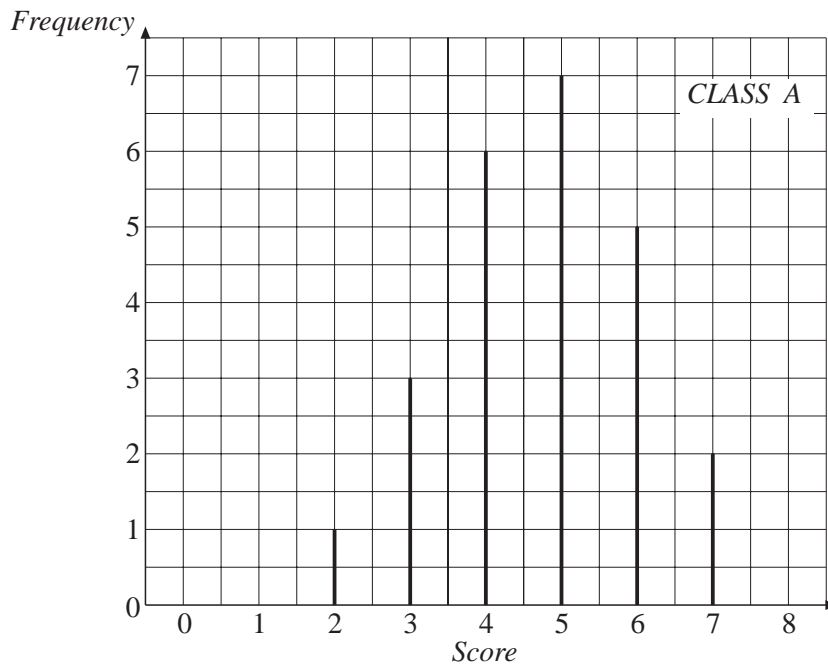
1. (a) Calculate the *mean* and *range* for these two data sets:

Set A 3 6 7 9 10 15 16 8 9 9

Set B 8 10 11 8 7 12 9 9 8 10

- (b) Describe the differences between the two sets.

2. These vertical line diagrams show the results obtained by 2 classes on a spelling test:



Extra Exercises 18.4

- (a) How many people are there in each class?
 - (b) Write down the *mode* for each class.
 - (c) Write down the *range* for each class.
 - (d) Write down the *median* for each class
 - (e) Which class do you think is better at spelling? Explain your answer.
3. A gardener has 2 different types of apple tree in his garden. He keeps records of the number of apples that each tree produces each year.

Tree A 14 16 22 18 19 25 18 20

Tree B 9 30 10 28 30 11 12 14

Describe the differences between the data for each tree, using the *mean* and *range* in your answer.

UNIT 18 *Quantitative Data*

Extra Exercises 18.5

1. (a) Calculate the 4 point moving averages for this set of data:
13 16 19 14 16 19 22 17

(b) Predict the next 2 values.

2. By finding the 4 point moving averages, predict the next two values of this set of data:
3.1 6.2 9.4 4.1 3.9 7.0 10.2 4.9

3. (a) Calculate the 4 point moving averages for this set of data:
10.1 8.7 6.5 12.3 10.5 9.5 7.7 13.9

(b) Describe how the moving averages are changing.

(c) Predict the next two values.

UNIT 20 *Arithmetic: Fractions***Extra Exercises 20.1**

1. Calculate:

- | | | |
|------------------|--------------------|-------------------|
| (a) $142 + 96$ | (b) $237 - 129$ | (c) $3.7 + 2.01$ |
| (d) $5.6 - 3.2$ | (e) $4.9 - 1.05$ | (f) $8.2 + 6.203$ |
| (g) $0.9 - 0.22$ | (h) $0.92 + 0.871$ | (i) $3.2 - 1.52$ |

2. Calculate:

- | | | |
|----------------------|----------------------|-----------------------|
| (a) 8×7 | (b) 12×5 | (c) 6×24 |
| (d) 1.2×6 | (e) 3.7×5 | (f) 9.2×4 |
| (g) 2.4×1.2 | (h) 3.6×1.4 | (i) 2.4×3.01 |

3. Calculate:

- | | | |
|-------------------|--------------------|-------------------|
| (a) $124 \div 2$ | (b) $84 \div 4$ | (c) $165 \div 5$ |
| (d) $468 \div 3$ | (e) $2.4 \div 6$ | (f) $8.4 \div 7$ |
| (g) $15.6 \div 6$ | (h) $13.53 \div 3$ | (i) $37.8 \div 9$ |

4. Packets of football stickers cost 32p each. How much would 8 packets cost?

5. 4 kg of sweets are shared out equally between 5 children. How many kg of sweets does each child have?

UNIT 20 *Arithmetic: Fractions***Extra Exercises 20.2**

1. Calculate:

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

(b) $\frac{4}{7} + \frac{2}{7}$

(c) $\frac{2}{9} + \frac{5}{9}$

(d) $\frac{9}{10} - \frac{3}{10}$

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

(f) $\frac{7}{9} - \frac{2}{9}$

(g) $\frac{8}{11} - \frac{5}{11}$

(h) $\frac{4}{11} + \frac{7}{11}$

(i) $\frac{6}{13} - \frac{2}{13}$

2. Calculate:

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

(b) $\frac{3}{10} + \frac{2}{5}$

(c) $\frac{3}{4} + \frac{1}{8}$

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

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

(f) $\frac{1}{3} + \frac{1}{6}$

(g) $\frac{1}{3} - \frac{1}{7}$

(h) $\frac{5}{6} - \frac{1}{2}$

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

3. Calculate:

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

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

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

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

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

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

4. Laura eats $\frac{1}{5}$ of a cake. Her sister Claire eats $\frac{1}{4}$ of the cake. What fraction of the cake is left?

UNIT 20 *Arithmetic: Fractions***Extra Exercises 20.3**

1. Calculate:

(a) $\frac{1}{2} \times 18$

(b) $\frac{1}{4} \times 24$

(c) $\frac{1}{6} \times 30$

(d) $\frac{2}{3} \times 60$

(e) $\frac{3}{4} \times 20$

(f) $\frac{4}{5} \times 30$

(g) $\frac{5}{9} \times 36$

(h) $\frac{4}{7} \times 28$

(i) $\frac{3}{7} \times 21$

2. Calculate:

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

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

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

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

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

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

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

(h) $\frac{1}{6} \times \frac{2}{3}$

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

3. Calculate:

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

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

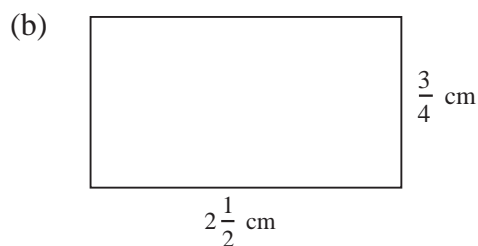
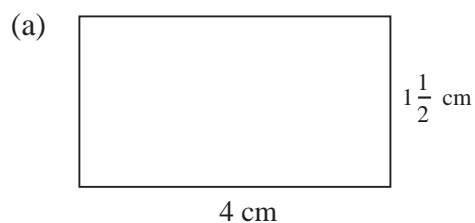
(c) $4\frac{1}{5} \times \frac{1}{3}$

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

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

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

4. Write down the area of each of these rectangles:



UNIT 20 *Arithmetic: Fractions***Extra Exercises 20.4**

1. Calculate:

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

(b) $8 \div \frac{1}{4}$

(c) $9 \div \frac{1}{5}$

(d) $\frac{1}{4} \div 2$

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

(f) $\frac{5}{8} \div 5$

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

(h) $1\frac{1}{2} \div 4$

(i) $3\frac{1}{4} \div 13$

2. Calculate:

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

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

(c) $\frac{5}{9} \div \frac{7}{9}$

(d) $\frac{3}{4} \div \frac{1}{8}$

(e) $\frac{1}{7} \div \frac{4}{5}$

(f) $\frac{2}{9} \div \frac{1}{8}$

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

(h) $\frac{5}{8} \div \frac{3}{4}$

(i) $\frac{3}{7} \div \frac{3}{4}$

3. Calculate:

(a) $1\frac{1}{2} \div \frac{3}{4}$

(b) $2\frac{1}{2} \div \frac{5}{7}$

(c) $4\frac{1}{2} \div 1\frac{1}{2}$

(d) $6\frac{1}{4} \div 1\frac{1}{2}$

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

(f) $5\frac{1}{4} \div 1\frac{1}{3}$

4. A car uses $\frac{3}{5}$ litres of fuel for every kilometre it travels. How far can it travel if it uses:

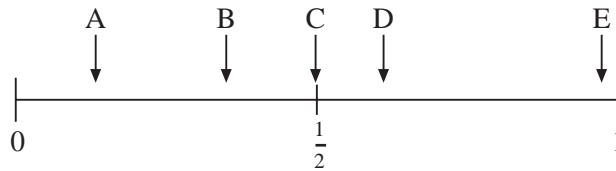
(a) 3 litres of fuel

(b) $2\frac{1}{2}$ litres of fuel ?

UNIT 21 *Probability of One Event*

Extra Exercises 21.1

1. This probability line shows the probabilities of 5 events, A, B, C, D and E:



- (a) Which event is *unlikely* to take place?
 (b) Which event is *almost certain* to take place?
 (c) Which event has an *even chance* of taking place?
 (d) Which of the events B and D is *most likely* to take place?
2. The events A, B, C, D and E are described below:

A : it will rain tomorrow

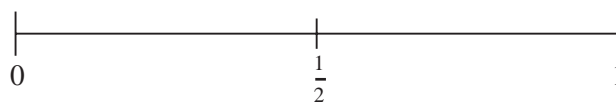
B : it will snow tomorrow

C : it will be very hot tomorrow

D : the temperature will be below freezing tomorrow

E : there will be a hailstorm tomorrow

Mark the probability of each event on a probability line like the one below:



3. Describe an event that is:
- (a) *almost certain*,
 (b) *almost impossible*,
 (c) has an *even chance*.

UNIT 21 *Probability of One Event***Extra Exercises 21.2**

1. There are 14 boys and 16 girls in a class. The headteacher selects one pupil at random. What is the probability that this pupil is:
 - (a) a girl,
 - (b) a boy?

2. A bag contains 8 blue sweets, 7 red sweets and 5 green sweets. A sweet is taken at random from the bag. What is the probability that it is:
 - (a) blue,
 - (b) red,
 - (c) green,
 - (d) yellow,
 - (e) red *or* green,
 - (f) blue *or* red?

3. A letter is selected at random from the word

F I B O N A C C I

What is the probability that the letter is:
 - (a) A,
 - (b) C,
 - (c) I,
 - (d) a vowel?

4. A tennis club has 100 members. Of these, 65 are adults and the rest are children. A member is selected at random. What is the probability that this member is a child?

UNIT 21 *Probability of One Event***Extra Exercises 21.3**

1. Jasmin tosses a fair coin 200 times and obtains 108 heads. Calculate the relative frequency that can be used to estimate the probability of obtaining:
- (a) a head,
- (b) a tail.

2. The numbers of goals scored by a famous footballer in 30 matches are:

0	2	1	0	1	3	2	1	1	1
4	1	1	2	1	2	0	0	0	1
1	1	0	2	0	0	2	1	1	3

From this data, estimate the probability that, in one match, he:

- (a) scores *no* goals,
- (b) scores *one or more* goals,
- (c) scores *three or more* goals.
3. Alex keeps daily records of whether or not it rains in the month of April.

R = Rain

D = Dry

R	R	R	D	R	R	R	D	D	D
D	R	D	R	R	D	D	D	D	R
R	R	R	D	D	D	D	D	D	R

From this data, estimate the probability that it:

- (a) rains on a day in April,
- (b) does not rain on a day in April.

UNIT 21 *Probability of One Event***Extra Exercises 21.4**

1. The probability that a school hockey team scores at least one goal in a match is 0.6. What is the probability that the team does *not* score any goals?
2. The probability that a train is late is 0.02. What is the probability that it is *not* late?
3. A card is taken at random from a complete pack of playing cards. The probability that it is a 7 is $\frac{1}{13}$. What is the probability the it is *not* a 7 ?
4. A packet of sweets contains 8 red sweets out of a total of 40. A sweet is taken at random from the packet.
 - (a) What is the probability that the sweet is red?
 - (b) What is the probability that it is *not* red?
5. The probability that a football team wins their next match is 0.3 and the probability that they lose is 0.4.
What is the probability that they draw their next match?
6. The probability that a trick coin lands heads up is 0.85. What is the probability that it lands tails up?

UNIT 21 *Probability of One Event***Extra Exercises 21.5**

1. If you tossed a fair coin 700 times, how many heads would you expect to get?

2. If you rolled a fair dice 240 times, how many times would you expect to get:
 - (a) a 6,
 - (b) an even number,
 - (c) a prime number,
 - (d) a multiple of 3 ?

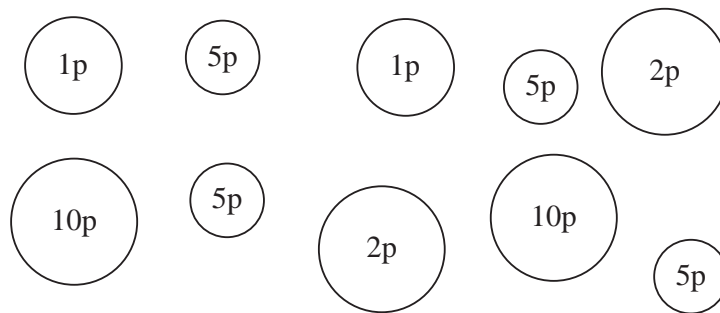
3. The probability that a school bus is late is 0.04. How many times would you expect the bus to be late in a 5-week period?

4. The probability that Ben beats his Grandad at a game of Othello is 0.2. If they play 10 games, how many can Ben expect to win?

5. Stuart's calculator has a fault and sometimes gives the wrong answer. He finds that the probability of getting a correct answer is $\frac{9}{10}$. How many wrong answers can he expect if he does 40 calculations?

UNIT 21 *Probability of One Event***Extra Exercises 21.6**

1. A bag contains 8 pink balls, 3 red balls and 9 purple balls. A ball is taken at random from the bag. What is the probability that it is:
- pink,
 - red,
 - purple,
 - pink *or* red,
 - pink *or* purple,
 - red *or* purple?
2. Emma's money box contains the coins shown below:

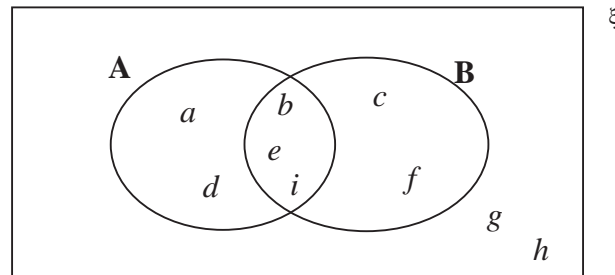


- She takes a coin out of her money box at random. What is the probability that the coin is:
- a 10p *or* a 5p,
 - a 1p *or* a 2p,
 - a 1p *or* a 10p,
 - a 2p *or* a 5p ?
3. A packet contains 20 sweets, which includes 6 mint creams. The probability that a sweet taken at random from the packet is an eclair is $\frac{1}{4}$. What is the probability that a sweet taken at random from the bag is an eclair *or* a mint cream?

UNIT 21 Probability of One Event

Extra Exercises 21.7

1. The letters a, b, c, d, e, f, g, h and i are sorted into sets A and B, as shown in the Venn diagram below:



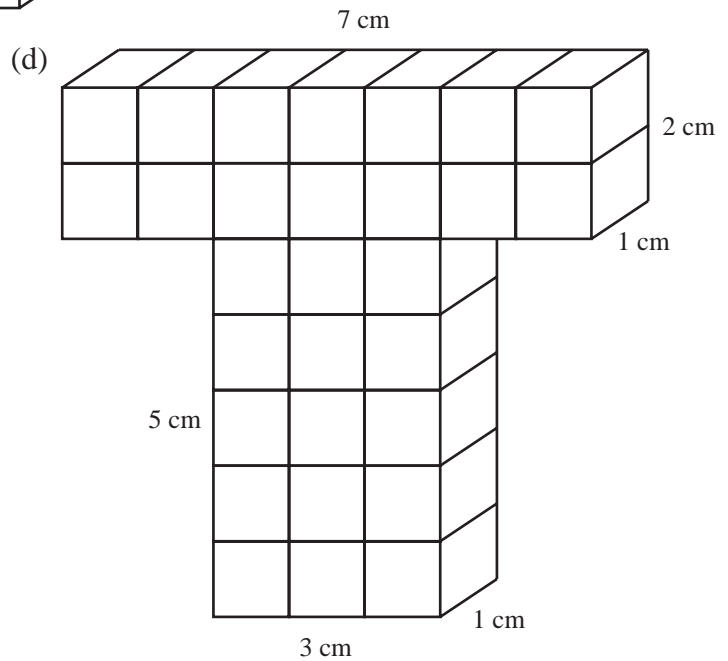
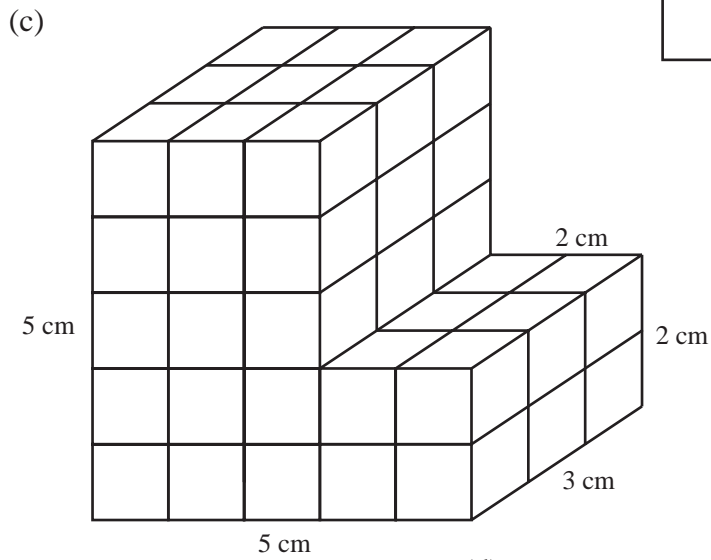
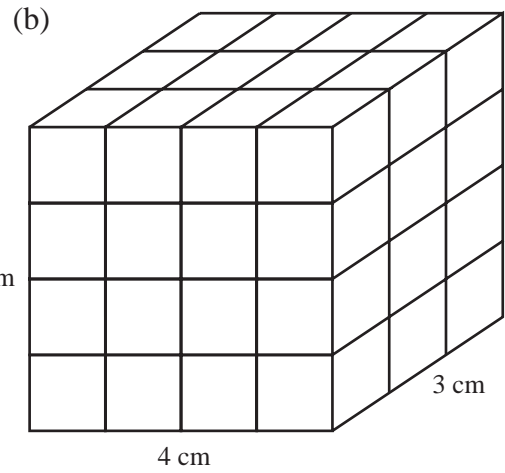
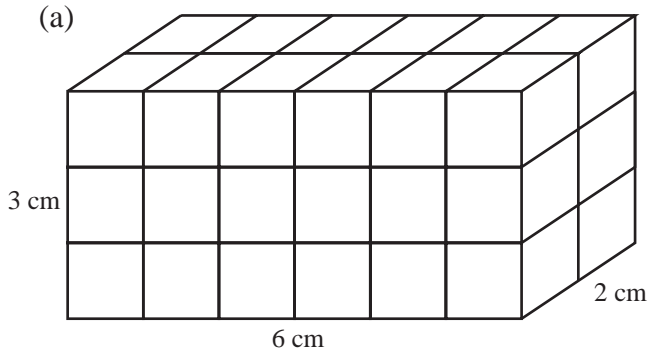
One of these letters is chosen at random. Calculate the probability that this letter is a member of:

- A,
 - B,
 - A and B,
 - A or B.
2. One of the numbers 1 to 20 is chosen at random. What is the probability that it is:
- an odd number,
 - a prime number,
 - an odd number *and* a prime number,
 - an odd number *or* a prime number.
3. If $p(A) = \frac{1}{2}$, $p(B) = \frac{3}{4}$ and $p(A \text{ or } B) = \frac{7}{8}$, determine $p(A \text{ and } B)$.
4. If $p(A) = \frac{1}{3}$, $p(B) = \frac{1}{4}$ and $p(A \text{ and } B) = \frac{1}{6}$, determine $p(A \text{ or } B)$.

UNIT 22 *Volume*

Extra Exercises 22.1

1. Calculate the volume of each of the shapes below:

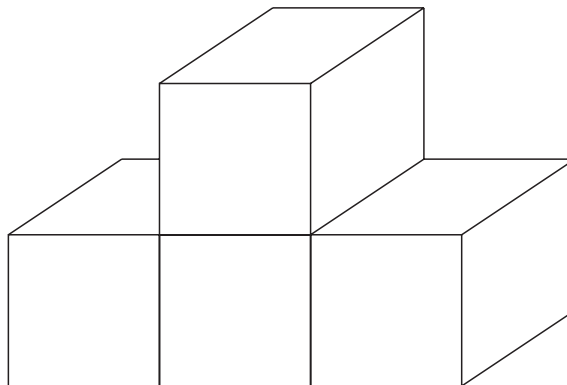


Extra Exercises 22.1

2. A cuboid is to be made from 1 cm cubes placed on a rectangular base. The size of the base is 4 cm by 5 cm.
 - (a) How many cubes are used to form the first layer of cubes?
 - (b) How many cubes are used in the cuboid if it is 10 cm high?

UNIT 22 *Volume***Extra Exercises 22.2**

- Calculate the volume of cubes with sides of length:
 - 8 cm
 - 12 cm.
- A cube has sides of length 20 cm. Calculate the volume of the cube in:
 - cm^3 ,
 - m^3
- A large box is a cube with sides of length 50 cm. Small cubes have sides of length 10 cm.
 - Calculate the volume of the large box.
 - Calculate the volume of a small cube.
 - How many small cubes will fit into the large box?
- A box is a cube with sides of length 0.4 m. Calculate the volume of the box in:
 - m^3 ,
 - cm^3 .
- The shape below is built from cubes with sides of length 2 cm.

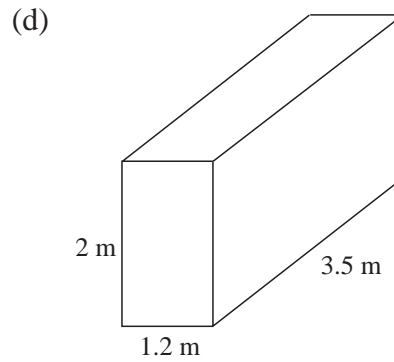
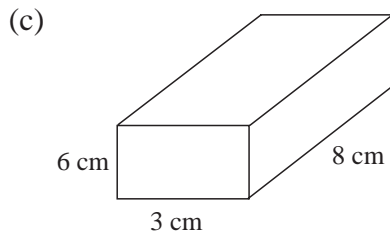
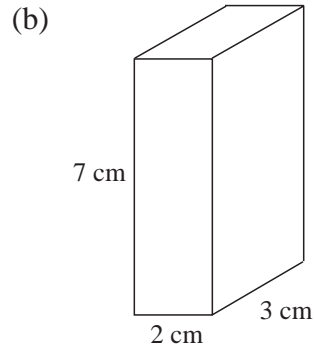
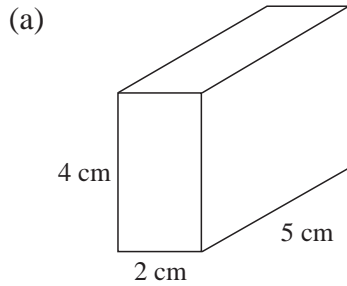


What is the volume of the shape?

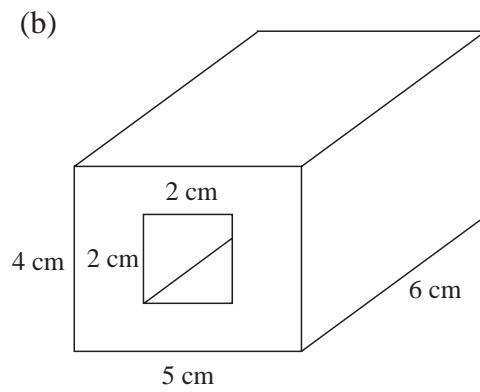
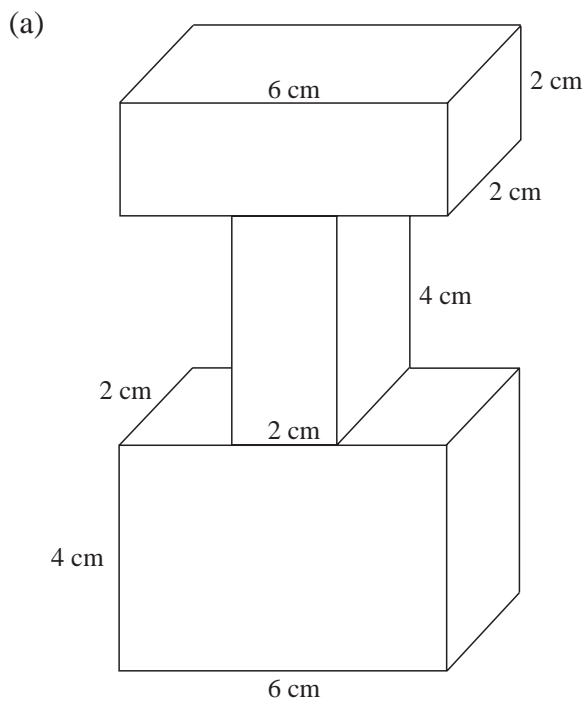
UNIT 22 *Volume*

Extra Exercises 22.3

1. Calculate the volume of each of the cuboids below:



2. Calculate the volume of each of the shapes below:



Extra Exercises 22.3

3. A box, with sides of length 6 cm, 12 cm and 10 cm, is put into a larger box which has sides of length 10 cm, 20 cm and 30 cm.
Calculate the volume of the empty space in the larger box.

UNIT 22 *Volume***Extra Exercises 22.4**

1. Copy and complete the table below:

<i>Volume in litres</i>	<i>Volume in cm³</i>
8	
3	
0.5	
0.2	
	6000
	3000
	3500
	800
	1200

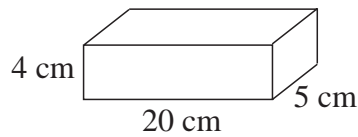
2. A tank has sides of length 2 m, 2 m and 1 m.

Calculate the capacity of the tank in:

- (a) m³
 (b) cm³
 (c) litres.
3. A plastic bottle holds 125 cm³ of drink. How many bottles can be filled from 6 litres of drink?
4. A tank has a base with sides of length 60 cm by 40 cm. The water in the tank is 50 cm deep. A rock is placed in the tank and the water rises by 20 cm. Calculate the volume of the rock.

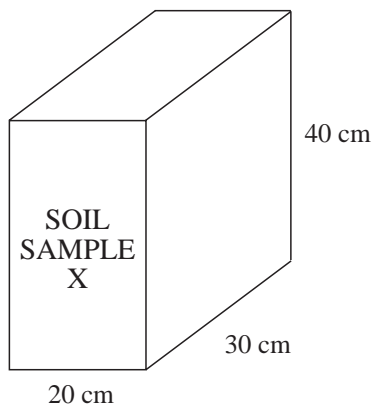
UNIT 22 *Volume***Extra Exercises 22.5**

- The density of water is 1 gram/cm^3 .
Calculate the mass of the following volumes of water:
(a) 700 cm^3 (b) 3 litres (c) 3 m^3 .
- A metal block has a mass of 0.6 kg. The dimensions of the block are shown below:

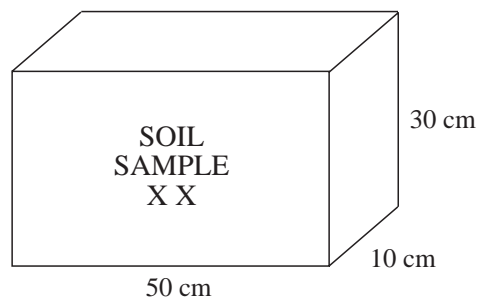


Calculate the density of the metal in:

- grams/ cm^3 ,
 - kg/ m^3 .
- The density of sea water is greater than the density of pure water. The mass of 20 litres of sea water is 21 kg.
Calculate the density of this mass of sea water.
 - Two samples, X and XX, of different types of soil are brought to a laboratory in full boxes. Use the information below to find the density of each soil sample:



19.2 kg

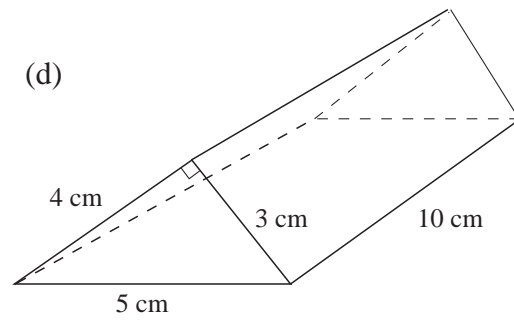
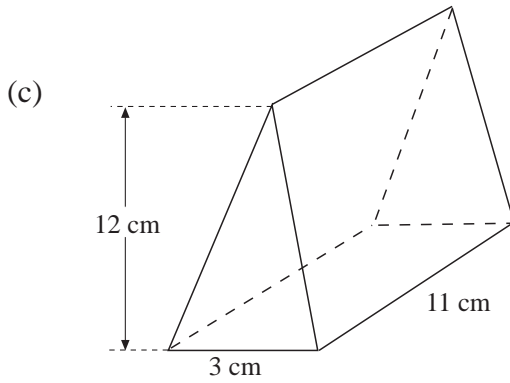
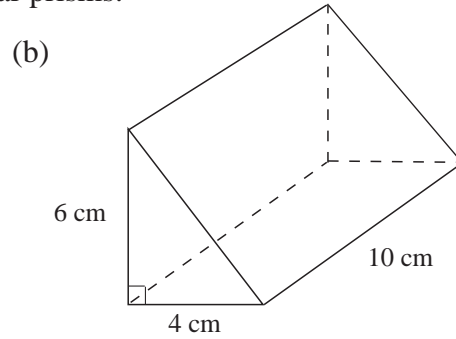
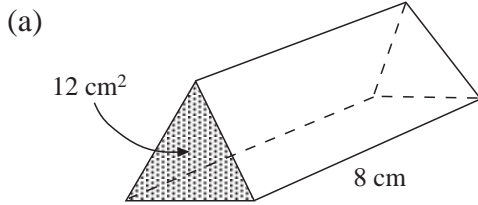


10.5 kg

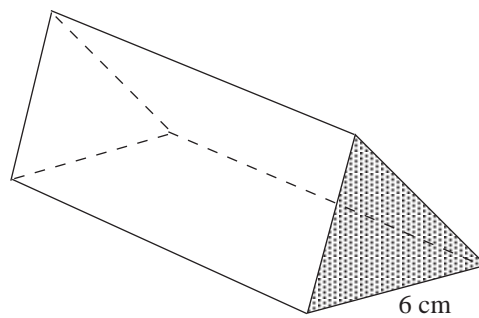
UNIT 22 Volume

Extra Exercises 22.6

1. Calculate the volume of each of these triangular prisms:



2. The prism below has volume 78 cm^3 . What is the area of the shaded face of the prism?



3. The area of cross-section of a prism is 15 cm^2 . If the volume of the prism is 750 cm^3 , what is its length?