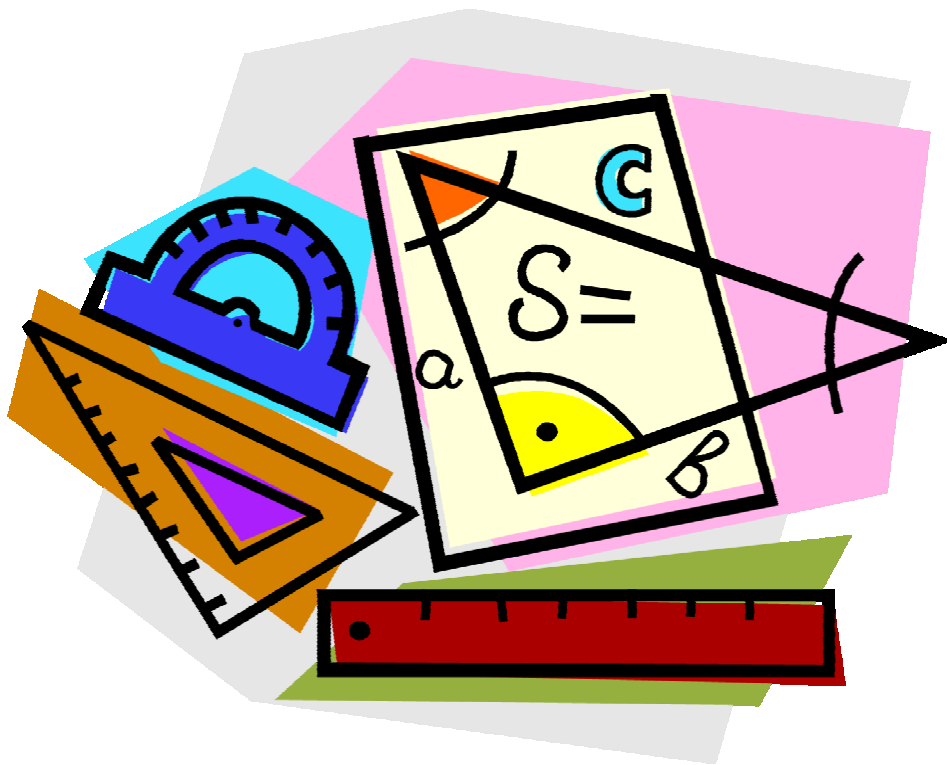




**Coatbridge High School  
Mathematics Department**



**Homework Booklet**

**CfE Level 3**

**MNU 3-01a: I can round a number using an appropriate degree of accuracy, having taken into account the context of the problem.**

### Exercise 1

- Round to the nearest 10 :-  
(a) 71                      (b) 78                      (c) 129                      (d) 1995.
- Round to the nearest 100 :-  
(a) 291                      (b) 78                      (c) 781                      (d) 23 559.
- Round to the nearest 1000 :-  
(a) 4500                      (b) 7299                      (c) 18 901                      (d) 1 234 567.
- A fossil was discovered and was carbon dated at 127 891 years old. Round this figure to the nearest :-  
(a) 10                      (b) 100                      (c) 10 000                      (d) 100 000.

### Exercise 2

- By rounding each number to 1 figure accuracy, find an estimate to each of the following :-  
(a)  $59 \times 19$                       (b)  $402 \times 99$                       (c)  $379 \times 320$   
(d)  $794 \div 38$                       (e)  $512 \div 22$                       (f)  $1961 \div 197$
- Nineteen houses in a street each use 311 litres of water every day.  
Approximately how many litres of water is this altogether ?
- The number of termites found in 196 mounds was 131 089.  
Approximately how many on average would each mound have ?



### Exercise 3

- When each of the following numbers is rounded to 1 decimal place, which of the two values in the brackets is the correct answer :-  
(a) 3.26 (3.2 or 3.3) ?                      (b) 1.38 (1.3 or 1.4) ?                      (c) 7.05 (7.0 or 7.1) ?  
(d) 18.91 (18.9 or 19.0) ?                      (e) 21.95 (21.9 or 22.0) ?                      (f) 0.04 (0.0 or 0.1) ?
- Copy and complete, rounding each number to 1 decimal place :-  
(a) 3.87129  $\rightarrow$  3. ...                      (b) 4.119999  $\rightarrow$                       (c) 8.29001  $\rightarrow$   
(d) 0.05012  $\rightarrow$                       (e) 5.909999  $\rightarrow$                       (f) 9.95078  $\rightarrow$
- Write down the answer to the following, correct to 1 decimal place :-  
(a)  $11 \div 7$                       (b)  $30 \div 9$                       (c)  $0.91 \div 4$                       (d)  $33 \div 34$                       (e)  $1 \div 6$
- Round these numbers to 2 decimal places :-  
(a) 3.46528                      (b) 5.97764                      (c) 2.31792  
(d) 6.37499                      (e) 8.41584                      (f) 7.04808

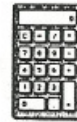
5. Change these fractions to decimals and round the answers to 2 decimal places :-

(a)  $\frac{7}{13} = (7 \div 13) = \underline{0.538461\dots} = 0.54$  (to 2 decimal places)

(b)  $\frac{5}{11} = (5 \div 11) = 0.45$

(c)  $\frac{10}{23} = (10 \div 23) = 0.43$

(d)  $\frac{3}{7} = 0.43$



**MNU 3-03a: I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions.**

**MNU 3-03b: I can continue to recall number facts quickly and use them accurately when making calculations.**

### Exercise 1

1. Write the following numbers in words :-

- (a) 3040                      (b) 5801                      (c) 20 300                      (d) 40 050                      (e) 10 010 010.

2. Write the following numbers out fully using digits :-

- (a) sixteen thousand and one                      (b) Eight hundred thousand and eighty  
(c) ten million, one hundred thousand                      (d) one hundred million and ten.

3. Write out in figures :-

- (a) 100 million                      (b) 0.5 million                      (c) 3.5 million                      (d) 0.8 million.

4. What does the 2 represent in each of these numbers :-

- (a)  $12\underline{.}789$                       (b)  $5\underline{.}203$                       (c)  $89\underline{.}542$                       (d)  $0\underline{.}1273$                       (e)  $0\underline{.}9123$  ?

5. Put the following sets of numbers in order, highest first :-

- (a) 9048, 9090, 8999, 10 010                      (b) 10 999, 11 001, 9999, 10 090, 10 100, 100 000.

6. Arrange the following groups of numbers in order, largest first :-

- (a) 0.5, 0.09, 0.14, 1.09, 0.091.  
(b) 1.003, 0.904, 0.409, 1.099, 1.1, 0.801.

7. What number lies half-way between :-

- (a) 10 000 and 15 000                      (b) 8500 and 10 000 ?

8. What number lies half way between :-

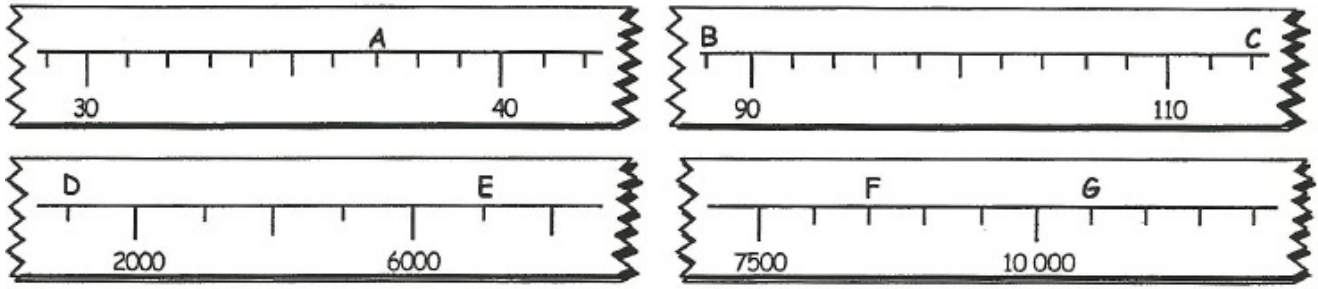
- (a) 0.12 and 0.18                      (b) 1.401 and 1.391                      (c) 2.315 and 2.325

9. What number is :-

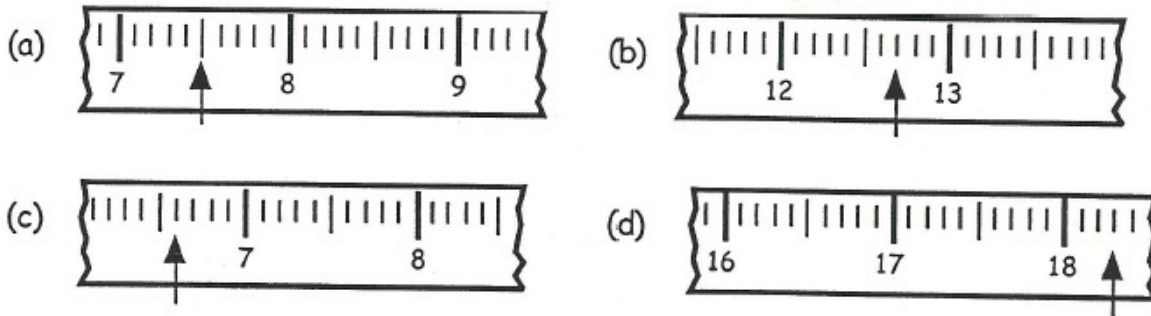
- (a)  $\frac{3}{10}$  up from 2.4                      (b)  $\frac{8}{100}$  down from 5.71                      (c)  $\frac{3}{1000}$  up from 2.475 ?

## Exercise 2

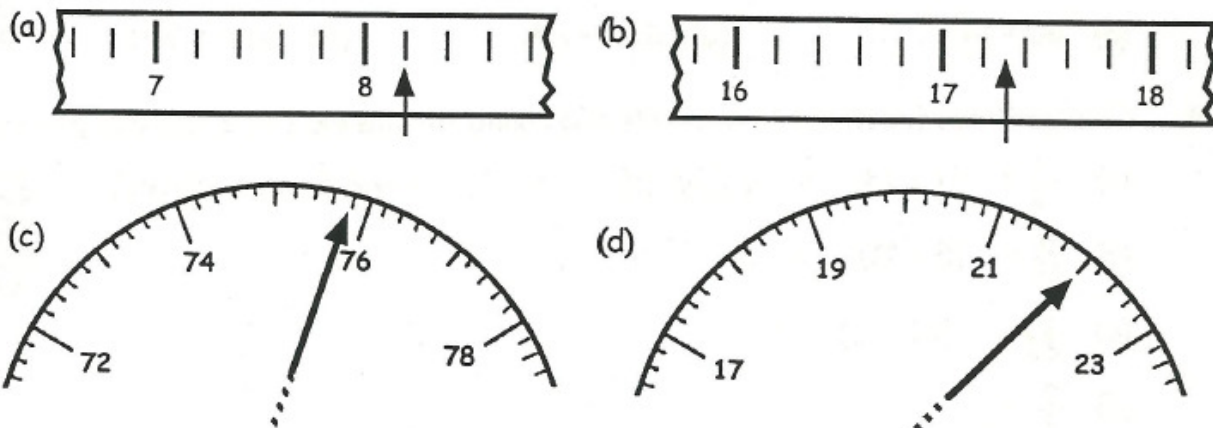
1. Look at the following scales. What numbers are represented by the letters A, B, C, ...



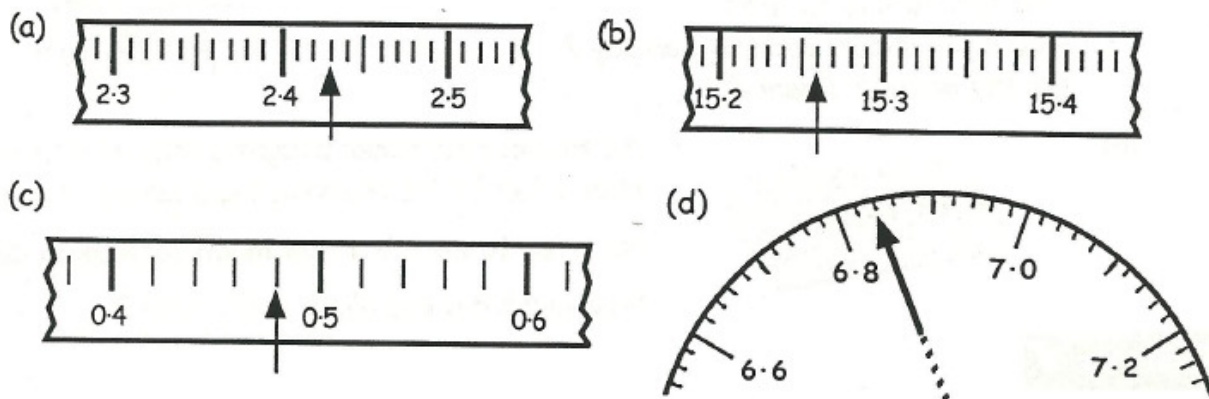
2. State what number each of these arrows is pointing to :-



3. Be careful here. Say what number each of these arrows is pointing to :-



4. State what number each of these arrows is pointing to :-



### Exercise 3

1. Do the following mentally :-

(a) A train carrying 84 passengers stops at a station and 27 get off the train.  
How many passengers are still on the train ?

(b) One hundred and ninety two passengers disembark from an aeroplane.  
If there are two hundred and seventeen passengers still on board, how  
many passengers were originally on the plane ?

(c) The population of Aylesbury is 48 700.  
The population of Bracknell is 57 500.

(i) Find the total population of both towns.

(ii) How many more people live in Bracknell than Aylesbury ?



2. The population of Cederton is 40 000.

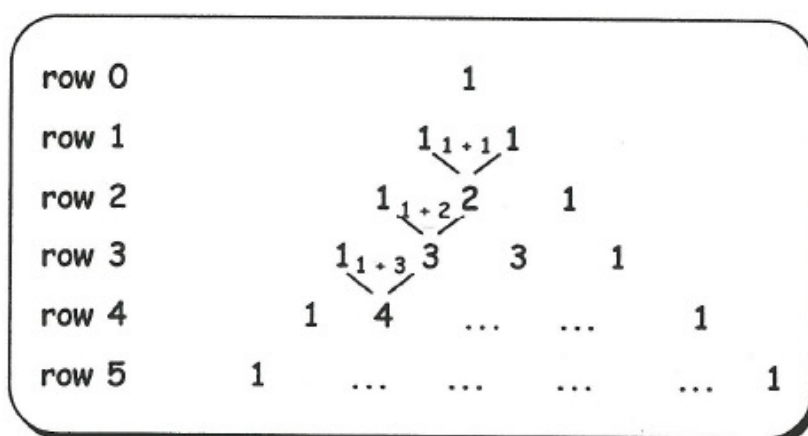
Of this population there are 16 500 men, 14 800 women and the rest are children.

How many children live in Cederton ?

3. In Pascal's triangle the  
number 1 appears at the  
top and at each end of  
subsequent rows as shown.  
To find a number inside  
the triangle add the two  
numbers above it.

(a) Copy and complete the  
triangle up to row 5.

(b) Continue the numbers up to row 10.



### Exercise 4

1. Do the following mentally :-

(a)  $3 \cdot 7 + 1 \cdot 2$       (b)  $5 \cdot 2 + 3 \cdot 9$       (c)  $18 \cdot 6 - 3 \cdot 5$       (d)  $23 \cdot 6 - 15 \cdot 8$       (e)  $15 \cdot 8 - 1 \cdot 01$

(f)  $5 \cdot 9 - 4 \cdot 09$       (g)  $0 \cdot 96 - 0 \cdot 4$       (h)  $54 \cdot 8 - 8 \cdot 91$       (i)  $0 \cdot 4 - 0 \cdot 17$       (j)  $12 \cdot 1 - 7 \cdot 84$

2. Copy and complete :-

(a) $\begin{array}{r} 47 \cdot 5 \\ + 35 \cdot 2 \\ \hline \end{array}$	(b) $\begin{array}{r} 8 \cdot 17 \\ + 5 \cdot 96 \\ \hline \end{array}$	(c) $\begin{array}{r} 1 \cdot 38 \\ - 1 \cdot 27 \\ \hline \end{array}$	(d) $\begin{array}{r} 19 \cdot 38 \\ - 9 \cdot 89 \\ \hline \end{array}$
---	---	---	--

(e) $22 \cdot 4 + 9 \cdot 9$	(f) $4 - 2 \cdot 3$	(g) $11 \cdot 7 - 3 \cdot 45$	(h) $5 \cdot 8 - 4 \cdot 92$
------------------------------	---------------------	-------------------------------	------------------------------

3. (a) A 3.4 kg bag of salt is added to a 1.9 kg bag.

- (i) What is the total weight ?
- (ii) What is the difference in weight ?

(b) In a formula one race Neeson's track times were 21.7 and 22.56 secs.

- (i) What was the combined time ?
- (ii) What was the difference in the times ?

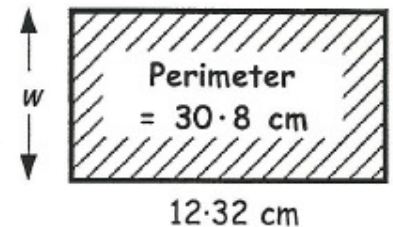


4. A scientist puts 3.9 ml of hydrochloric acid, 4.56 ml of acerbic acid and 9.65 ml of citric acid into a test tube.

- (a) What is the total amount of acid in the test tube ?
- (b) How much more citric than hydrochloric acid is there ?



5. Perimeter is the total distance around the outside of a shape. A rectangle has length 12.32 cm and perimeter of 30.8 cm. Find the width of the rectangle (show all your working).



### Exercise 5

1. Copy the following and complete the calculation :-

$$\begin{array}{r} (a) \quad 571 \\ \times 3 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} (b) \quad 435 \\ \times 7 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} (c) \quad 708 \\ \times 9 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} (d) \quad 5555 \\ \times 8 \\ \hline \\ \hline \end{array}$$

Rewrite each of these in the above form and complete the calculation :-

(a)  $207 \times 6$

(b)  $824 \times 8$

(c)  $1057 \times 4$

(d)  $5 \times 888$

2. Set down and complete :-

$$\begin{array}{r} (a) \quad 248 \\ \times 26 \\ \hline \dots\dots\dots \\ \dots\dots\dots 0 \\ \hline \dots\dots\dots \\ \hline \end{array}$$

$$\begin{array}{r} (b) \quad 546 \\ \times 59 \\ \hline \dots\dots\dots \\ \dots\dots\dots 0 \\ \hline \dots\dots\dots \\ \hline \end{array}$$

$$\begin{array}{r} (c) \quad 704 \\ \times 72 \\ \hline \dots\dots\dots \\ \dots\dots\dots \\ \hline \dots\dots\dots \\ \hline \end{array}$$

$$\begin{array}{r} (d) \quad 555 \\ \times 55 \\ \hline \dots\dots\dots \\ \dots\dots\dots \\ \hline \dots\dots\dots \\ \hline \end{array}$$

3. Copy the following and complete the calculation :-

(a)  $7 \overline{)3808}$

(b)  $5 \overline{)9265}$

(c)  $6 \overline{)7434}$

(d)  $8 \overline{)5216}$

4. Set down in the manner shown above and complete the calculation :-

(a)  $7273 \div 7$

(b)  $5175 \div 9$

(c)  $\frac{4506}{6}$

(d)  $\frac{6016}{8}$

5. Show all your working in answering the following questions :-

- (a) Mrs. Brown is paid £1408 a month. How much would she earn in 9 months ?
- (b) How many hours are there in a week ?
- (c) How many seconds are there in 4 hours ?
- (d) Find  $8 \times 4 \times 56$ .

6. Show all your working in answering the following questions :-

- (a) How many weeks are there in 343 days ?
- (b) Golf balls are packed with 6 in each box.  
How many boxes are needed for 258 balls ?
- (c) A nine hole golf course has length 1971 yards.  
Find the average length of each hole.
- (d) A pack of golf tees contains 8 tees.  
How many packs are needed for 2248 tees ?



### Exercise 6

1. Write down the answers to the following :-

- (a) 
$$\begin{array}{r} 4.34 \\ \times 4 \\ \hline \end{array}$$
- (b) 
$$\begin{array}{r} 8.27 \\ \times 7 \\ \hline \end{array}$$
- (c) 
$$\begin{array}{r} 8.78 \\ \times 6 \\ \hline \end{array}$$
- (d) 
$$\begin{array}{r} 119.38 \\ \times 9 \\ \hline \end{array}$$
- (e)  $5.7 \times 8$
- (f)  $42.3 \times 4$
- (g)  $135.9 \times 5$
- (h)  $7 \times 37.521$

2. Show all your working to the following questions :-

- (a) Fred the monkey eats 3.74 kg of food every day.

What is the weight of food Fred will eat in :-

- (i) 3 days
- (ii) a week ?



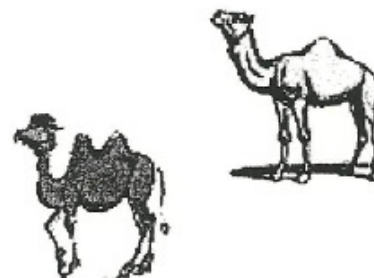
- (b) Boris the zoo keeper gets paid £7.84 an hour.

How much will Boris earn in :-

- (i) 4 hours
- (ii) 9 hours ?

- (c) Kevin the Camel eats six 3.71 kg boxes of dates every month.  
Karen the Camel eats five 4.09 kg boxes.

Who eats more and by how much ?



3. Copy and complete the following :-

- (a)  $2 \overline{)37.16}$
- (b)  $6 \overline{)91.44}$
- (c)  $7 \overline{)41.79}$
- (d)  $8 \overline{)129.12}$

4. Find :-

- (a)  $35.7 \div 7$
- (b)  $57.06 \div 6$
- (c)  $0.072 \div 8$

5. Show all your working for the following questions :-

(a) Nine bricks have a total length of 2.61 metres.

What is the length of 1 brick ?

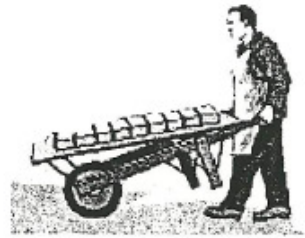
(b) Three kegs of beer hold 3072.6 litres.

How much beer does one keg hold ?

(c) Find :-

(i) a third of 19.8      (ii) a ninth of 51.66

(iii) a sixth of 6.06      (iv) a fifth of 0.7



6. Two shops sell identical shirts.

Shop A sells three shirts for a total cost of £8.79.

Shop B sells five shirts for a total cost of £14.75.

Which shop has the best deal ? Explain.



## Exercise 7

1. Write down the answers to the following :-

(a)  $22 \times 10$

(b)  $10 \times 39$

(c)  $104 \times 10$

(d)  $10 \times 340$

(e)  $2020 \times 10$

(f)  $34 \times 100$

(g)  $100 \times 40$

(h)  $101 \times 100$

(i)  $2010 \times 100$

(j)  $8100 \times 100$

(k)  $21 \times 1000$

(l)  $1000 \times 70$

(m)  $200 \times 1000$

(n)  $3050 \times 1000$

(o)  $1000 \times 1000$

(p)  $5000 \times 1000$

2. There are 1000 ml (millilitres) in 1 litre.

How many ml in :-

(a) 4 litres

(b) 30 litres

(c) 12 litres

(d) 150 litres

(e) 100 litres

(f) 1000 litres ?

3. Write down the answers to the following :-

(a)  $20 \div 10$

(b)  $300 \div 10$

(c)  $14\,000 \div 10$

(d)  $200\,000 \div 10$

(e)  $1\,000\,000 \div 10$

(f)  $400 \div 100$

(g)  $8000 \div 100$

(h)  $5400 \div 100$

(i)  $99\,000 \div 100$

(j)  $120\,400 \div 100$

(k)  $8000 \div 1000$

(l)  $42\,000 \div 1000$

(m)  $870\,000 \div 1000$

(n)  $909\,000 \div 1000$

(o)  $1000 \div 1000$ .

4. There are 1000 ml (millilitres) in a litre.

How many litres in :-

(a) 50 000 ml

(b) 100 000 ml

(c) a million ml ?

## Exercise 8

1. Write down the answers to the following :-

(a)  $8.4 \times 10$

(b)  $9.8 \times 10$

(c)  $7.62 \times 10$

(d)  $18.71 \times 10$



- (e)  $6.41 \times 100$       (f)  $0.91 \times 100$       (g)  $4.021 \times 100$       (h)  $0.0054 \times 100$   
 (i)  $5.213 \times 1000$       (j)  $0.8765 \times 1000$       (k)  $1.0041 \times 1000$       (l)  $4.2 \times 1000$

2. A crate weighs 47.62 kg. What would be the weight of :-

- (a) 10 crates      (b) 100 crates      (c) 1000 crates      (d) 10 000 crates ?

3. There are 1000 millilitres in a litre. How many millilitres are there in :-

- (a) 5 litres      (b) 7.62 litres      (c) 0.0415 litres      (d) 0.01 litres ?

4. Write down the answers to the following :-

- (a)  $28.6 \div 10$       (b)  $19.8 \div 10$       (c)  $7.62 \div 10$       (d)  $187.1 \div 10$   
 (e)  $64.1 \div 100$       (f)  $10.91 \div 100$       (g)  $4.2 \div 100$       (h)  $0.54 \div 100$   
 (i)  $521.3 \div 1000$       (j)  $0.8 \div 1000$       (k)  $1.004 \div 1000$       (l)  $9 \div 1000$

5. The length of 100 sections of railway track is 412.6 metres long.

- (a) What is the length of each section in metres ?  
 (b) Change your answer to centimetres.



6. Try to do the following mentally :-

- (a)  $32 \times 30$       (b)  $41 \times 60$       (c)  $50 \times 321$       (d)  $404 \times 90$   
 (e)  $12 \times 300$       (f)  $42 \times 400$       (g)  $500 \times 21$       (h)  $800 \times 312$   
 (i)  $9021 \times 30$       (j)  $312 \times 7000$       (k)  $2000 \div 20$       (l)  $4400 \div 400$   
 (m)  $80\,400 \div 200$       (n)  $1 \text{ million} \div 2000$       (o)  $10 \text{ million} \div 50\,000$



7. A box contains 50 matches.

How many matches are in :- (a) 50 boxes      (b) 231 boxes ?



8. 34 200 marbles are stored equally amongst 200 jars.

How many marbles will be in each jar ?

9. A jar hold 340 sweets. A box hold 20 jars. A crate holds 30 boxes.

How many sweets would there be in 20 crates ?



10.

(a) A fishing trip company stocks 320 jars of worms. Each jar contains 30 worms.

How many worms in total does the company stock ?

(b) On a fish farm 24 000 fish are kept in 30 tanks.

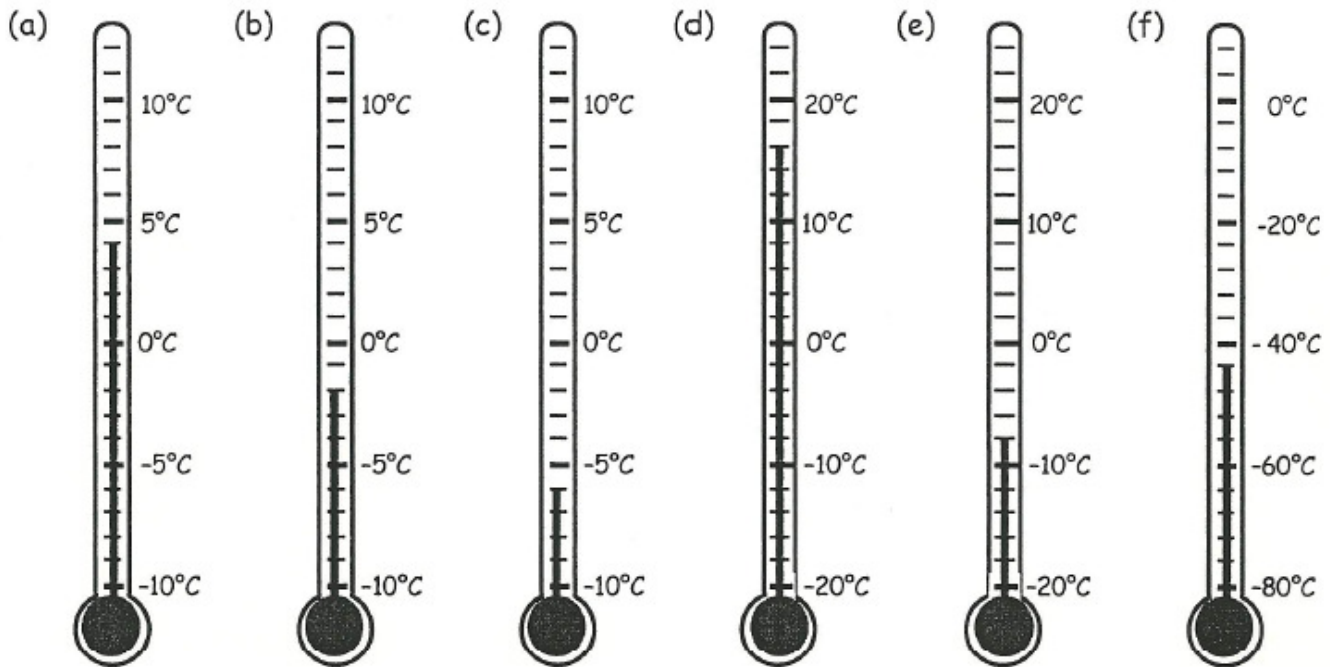
If each tank has the same number of fish, how many fish are in each tank ?



**MNU 3-04a: I can use my understanding of numbers less than zero to solve simple problems in context.**

**Exercise 1**

1. Write the temperatures shown by each thermometer.



2. (a) I had £30 in my bank account. I withdrew £45. What was my new bank balance?  
 (b) John had £35 in his account. He withdrew £60. What was his new bank balance?  
 (c) Susie had £30 in her bank account. After withdrawing some money, her balance was then (-£40). How much money had she withdrawn?

3. Write the ages of these Romans when they died :-

- (a) Bigus Thickus born in 80 B.C. and died in 4 A.D.  
 (b) Uglis Puglis born in 12 B.C. and died in 37 A.D.  
 (c) Maximus Bumus born in 53 B.C. and died in 7 A.D.  
 (d) Pukus Mucus died in 47 A.D. and was born in 54 B.C.



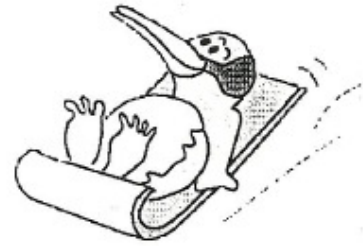
**Exercise 2**

1. What is the temperature that is :-

- (a) 7°C up from 2°C ?      (b) 5°C up from 5°C ?      (c) 10°C up from 0°C ?  
 (d) 5°C down from 7°C ?      (e) 12°C down from 15°C ?      (f) 7°C down from 0°C ?  
 (g) 3°C up from -2°C ?      (h) 7°C up from 1°C ?      (i) 5°C up from -7°C ?  
 (j) 9°C down from 4°C ?      (k) 3°C down from -4°C ?      (l) 25°C down from -25°C ?

2. Copy and complete using the words ".....°C up" or "..... °C down" :-
- (a) 11°C is 4°C down from 15°C.                      (b) -13°C is..... from 5°C.  
 (c) 9°C is ..... from -3°C.                      (d) 6°C is..... from -1°C.  
 (e) 3°C is..... from -9°C.                      (f) -19°C is..... from 5°C.

3. The temperature in Glasgow on Christmas day was 3°C.  
 On Boxing Day the temperature had dropped by 5°C.  
 What was the temperature on Boxing Day ?



4. The temperature in Moscow yesterday changed as follows :-

<u>Noon</u>	<u>3 p.m.</u>	<u>6 p.m.</u>	<u>9 p.m.</u>	<u>Midnight</u>
2°C	down by 5°C	up by 1°C	down by 8°C	down by 5°C

What was the temperature at (a) 3 p.m.                      (b) 6 p.m.                      (c) Midnight ?

### Exercise 3

1. Copy and find :-

- |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| (a) 5 + 4       | (b) 5 + (-2)    | (c) 4 + (-1)    | (d) 6 + (-6)    |
| (e) (-2) + 4    | (f) (-4) + 1    | (g) (-2) + 2    | (h) (-9) + 6    |
| (i) 8 + (-10)   | (j) (-12) + 15  | (k) 13 + (-18)  | (l) (-9) + 13   |
| (m) (-2) + (-2) | (n) (-5) + (-1) | (o) (-9) + (-3) | (p) (-6) + (-6) |

2. Find :-

- |              |              |               |              |
|--------------|--------------|---------------|--------------|
| (a) 3 - 2    | (b) 5 - 8    | (c) 2 - 8     | (d) 5 - 11   |
| (e) (-2) - 5 | (f) (-4) - 2 | (g) (-5) - 5  | (h) (-9) - 3 |
| (i) (-1) - 1 | (j) (-3) - 1 | (k) (-12) - 5 | (l) (-8) - 8 |

### Exercise 4

1. Copy and complete :-

- |              |              |              |              |
|--------------|--------------|--------------|--------------|
| (a) 3 × (-2) | (b) 5 × (-4) | (c) 3 × (-7) | (d) (-7) × 2 |
| (e) (-4) × 3 | (f) (-5) × 3 | (g) (-5) × 5 | (h) (-8) × 7 |
| (i) 7 × (-5) | (j) (-7) × 5 | (k) (-6) × 9 | (l) (-9) × 6 |

2. Copy and find :-

- |               |               |                |                 |
|---------------|---------------|----------------|-----------------|
| (a) (-6) ÷ 2  | (b) (-4) ÷ 2  | (c) (-35) ÷ 7  | (d) (-16) ÷ 4   |
| (e) (-40) ÷ 5 | (f) (-51) ÷ 3 | (g) (-55) ÷ 5  | (h) (-56) ÷ 7   |
| (i) (-70) ÷ 5 | (j) (-74) ÷ 2 | (k) (-108) ÷ 9 | (l) (-290) ÷ 10 |

## Exercise 4

- COPY the following as shown and place a "<" sign or a ">" sign between the numbers correctly :-
 

(a) 5 ... 6	(b) 9 ... 5	(c) 0 ... -1
(d) -5 ... -1	(e) 2 ... -1	(f) -8 ... -11
(g) -4 ... 0	(h) -6 ... -5	(i) -22 ... -19
(j) -11 ... -10	(k) -300 ... -200	(l) 16 ... $16\frac{1}{2}$
- In this question you must choose  $x$  only from the numbers .....  $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$  :-
 

(a) $x > 7$	(b) $x < 2$	(c) $x \geq 9$
(d) $x \leq 1$	(e) $x > 1$	(f) $x < 1$
(g) $x > 9$	(h) $x \geq 0$	(i) $x \leq 0$
- In this question you must choose  $y$  only from the numbers,  $\{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$  :-
 

(a) $y > 2$	(b) $y < 1$	(c) $y \geq -2$
(d) $y \leq 1$	(e) $y > -1$	(f) $y \leq -4$
(g) $y > -5$	(h) $y < -5$	(i) $y \geq 4$

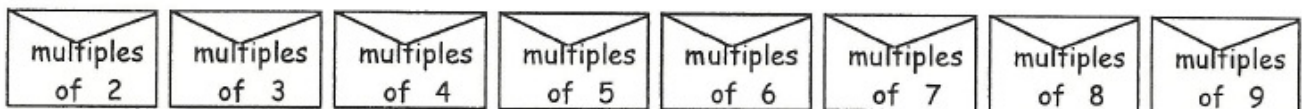
**MNU 3-05a: I have investigated strategies for identifying common multiples and common factors, explaining my ideas to others, and can apply my understanding to solve related problems**

## Exercise 1

- Write down the first six (non-zero) multiples of :-
 

(a) 5	(b) 3	(c) 9	(d) 12
-------	-------	-------	--------
- From the following list of numbers, say which envelopes each number should be placed in. (Some numbers can go in more than one envelope).

10, 12, 13, 16, 20, 24, 25, 28, 29, 30, 32, 35, 39, 40, 42, 45, 50, 51, 52, 56.



- Find the lowest common multiple (l.c.m.) of :-
 

(a) 2 and 3	(b) 3 and 5	(c) 6 and 9	(d) 5 and 10.
-------------	-------------	-------------	---------------

Find the l.c.m of :-

- |                |                |                 |                 |
|----------------|----------------|-----------------|-----------------|
| (a) 2, 3 and 4 | (b) 2, 4 and 6 | (c) 3, 5, and 6 | (d) 4, 5 and 7. |
|----------------|----------------|-----------------|-----------------|

- Baby frog croaks every 3 seconds.  
Mummy frog croaks every 6 seconds.  
Daddy frog croaks every 9 nine seconds.

How many seconds pass between them all croaking together ?



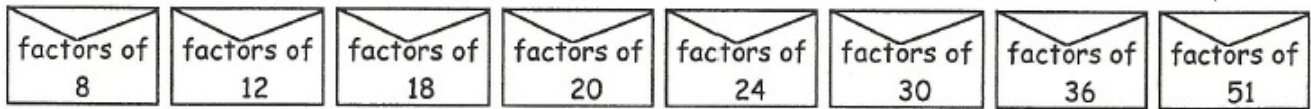
## Exercise 2

1. Write down the :-

(a) three factors of 4 (b) two factors of 5 (c) four factors of 27 (d) nine factors of 36

2. From the list of numbers, say which envelopes each number could be placed in.  
(Some numbers can go in more than one envelope).

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.



3. Find the highest common factor (h.c.f) of :-

(a) 8 and 10 (b) 12 and 15 (c) 29 and 37 (d) 36 and 48.

Find the h.c.f. of

(a) 6, 8 and 12 (b) 8, 12 and 24 (c) 5, 25 and 40 (d) 18, 36 and 54.

Find the l.c.m. and the h.c.f. of 24 and 48.

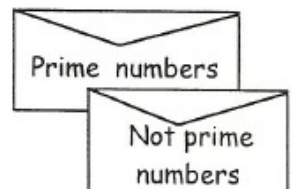
**MNU 3-05b: I can apply my knowledge of factors to investigate and identify when a number is prime.**

## Exercise 1

1. List all the primes numbers between :- (a) 10 and 20 (b) 50 and 60.

From the list of numbers, say which envelope each number could be placed in.

1, 4, 5, 6, 9, 11, 18, 21, 23, 27, 33, 35, 37, 39, 49, 51.



2. Say why each of the following numbers are definitely NOT prime numbers.

(a) 13572 (b) 55555 (c) 12345 (d) 54320.

Make a factor tree and find all the prime factors of :-

(a) 16 (b) 56 (c) 128

3. Running Bear can only cross the river by jumping one safe stone at a time.

Running Bear will have to take this path across the river.

Start with a square number.

Jump to a prime number.

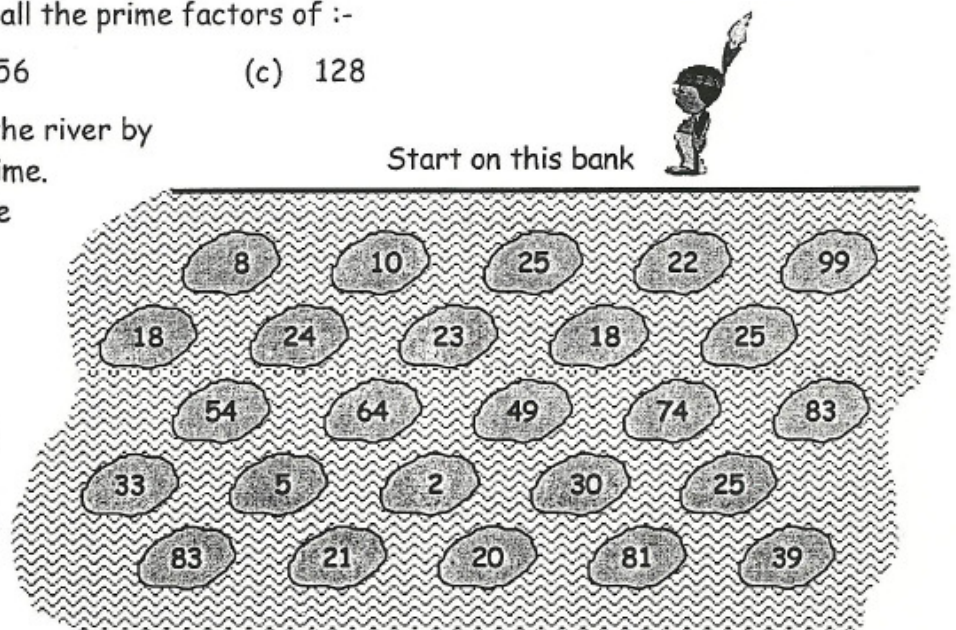
Jump to a multiple of 7.

Jump to a new prime number.

Jump to a factor of 15.

Jump to a new prime number.

Write down the list of numbers to safely cross the river.



**MNU 3-06a:** Having explored the notation and vocabulary associated with the whole number powers and the advantages of writing numbers in this form, I can evaluate powers of whole numbers mentally or using technology.

### Exercise 1

1. Find, without a calculator, the value of :-

- |           |           |           |            |
|-----------|-----------|-----------|------------|
| (a) $4^2$ | (b) $3^2$ | (c) $7^2$ | (d) $10^2$ |
| (e) $9^2$ | (f) $1^2$ | (g) $8^2$ | (h) $6^2$  |

2. Use a calculator (if you need to) to find the values of :-

- |            |            |            |             |
|------------|------------|------------|-------------|
| (a) $13^2$ | (b) $18^2$ | (c) $21^2$ | (d) $30^2$  |
| (e) $45^2$ | (f) $60^2$ | (g) $75^2$ | (h) $102^2$ |

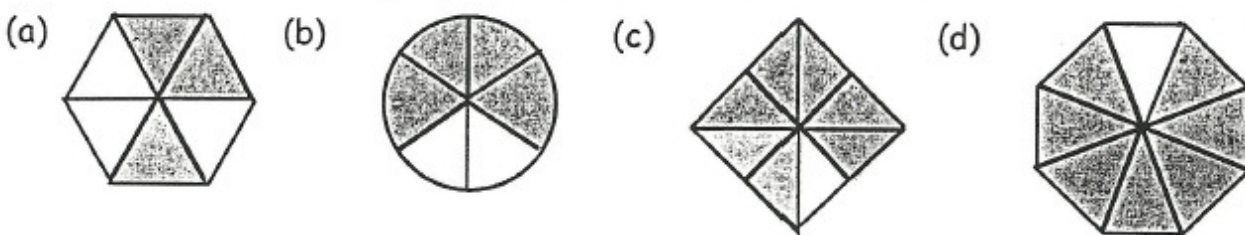
3. Find, without a calculator, the value of:-

- |            |              |           |              |
|------------|--------------|-----------|--------------|
| (a) $2^3$  | (b) $3^3$    | (c) $2^5$ | (d) $7^3$    |
| (e) $10^6$ | (f) $1^{15}$ | (g) $6^4$ | (h) $2^{10}$ |

**MNU 3-07a:** I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real-life situations.

### Exercise 1

1. For each of the following, say what fraction has been shaded :-



2. Simplify each fraction :-

- |                     |                    |                     |                       |
|---------------------|--------------------|---------------------|-----------------------|
| (a) $\frac{10}{20}$ | (b) $\frac{5}{25}$ | (c) $\frac{3}{12}$  | (d) $\frac{4}{24}$    |
| (e) $\frac{8}{30}$  | (f) $\frac{6}{45}$ | (g) $\frac{16}{48}$ | (h) $\frac{250}{600}$ |
| (i) $\frac{7}{42}$  | (j) $\frac{8}{36}$ | (k) $\frac{12}{42}$ | (l) $\frac{17}{51}$   |

3. Simplify :-

- |                      |                      |                      |                       |
|----------------------|----------------------|----------------------|-----------------------|
| (a) $\frac{17}{102}$ | (b) $\frac{27}{243}$ | (c) $\frac{11}{242}$ | (d) $\frac{23}{2323}$ |
|----------------------|----------------------|----------------------|-----------------------|

## Exercise 2

1. Find :-

- (a)  $\frac{1}{2}$  of 46                      (b)  $\frac{1}{3}$  of 39                      (c)  $\frac{1}{4}$  of 64                      (d)  $\frac{1}{7}$  of 63

2. Find :-

- (a)  $\frac{3}{4}$  of 36                      (b)  $\frac{2}{3}$  of 24                      (c)  $\frac{3}{7}$  of 21                      (d)  $\frac{4}{5}$  of 35  
(e)  $\frac{9}{10}$  of 210                      (f)  $\frac{5}{12}$  of 144                      (g)  $\frac{7}{8}$  of 648                      (h)  $\frac{11}{13}$  of 143

3. There are 240 first year pupils at Gracetown High School.  $\frac{3}{8}$  of them are boys.

- (a) How many boys are there ?                      (b) How many girls are there ?



4. Two thirds of the days in June were sunny days.

How many days were sunny ?



5. A computer predicts that in February 2007 two sevenths of the month would have snow falling.

How many days will not have snow falling ?



## Exercise 3

1. Write each of the following as a fraction and as a decimal :-

- (a) 41%                      (b) 93%                      (c) 7%                      (d) 23%  
(e) 99%                      (f) 11.5%                      (g) 1.5%                      (h) 8.25%

2. Write these percentages as fractions and simplify :-

- (a) 20%                      (b) 45%                      (c) 15%                      (d) 75%  
(e) 5%                      (f) 35%                      (g)  $66\frac{2}{3}\%$                       (h) 12.5%

3. Use a calculator where necessary and change each fraction to a percentage :-

- (a)  $\frac{8}{25}$                       (b)  $\frac{12}{40}$                       (c)  $\frac{5}{8}$                       (d)  $\frac{11}{80}$



4. Patel scored  $\frac{32}{50}$  for French,  $\frac{45}{72}$  for Music,  $\frac{18}{25}$  for English and  $\frac{21}{30}$  for Maths.

List Patel's subjects in order from best to worst.

## Exercise 4

1. Calculate :-

(a) 20% of £60

(b) 40% of 250 kg

(c) 60% of £150

(d) 15% of 120 g

(e) 8% of £66

(f) 38% of 500 cm

(g) 12% of £80

(h)  $12\frac{1}{2}\%$  of 240 €

(i)  $\frac{1}{2}\%$  of £8

2. Eighty percent of the 560 videos in a shop are rated "fifteen".  
How many videos are rated 15 ?



3. On holiday, Calvin spent 75% of his £450 spending money.  
How much did Calvin spend ?

4. Of the 380 goals scored in a season in Junior football,  
• 15% were scored by penalties and  
• 60% were scored by the home team.

(a) How many penalties were scored ?

(b) How many were scored by the away team ?



5. An advert makes up 2% of 1 hour's television.  
How long is an advert ?

## Exercise 5

1. Find the following, without a calculator :-

(a) 25% of £840

(b)  $33\frac{1}{3}\%$  of 96 metres

(c) 20% of 80 €

(d) 5% of 360 km

(e) 1% of £20

(f) 50% of 120 kg

(g)  $33\frac{1}{3}\%$  of 135 mm

(h) 10% of £5

(i) 5% of 380 €.

2. A 350 gram microwave pizza has only 5% fat.  
How many grams of fat does the pizza have ?



3. Find the following, without a calculator :-

(a) 50% of £9

(b)  $33\frac{1}{3}\%$  of 360 metres

(c) 80% of 90 €

(d) 25% of 300 p

(e) 60% of 240 p

(f)  $66\frac{2}{3}\%$  of 120 kg

(g) 70% of 520 cm

(h) 75% of 9600 kg

(i) 75% of £440

4. Explain how you might (mentally) calculate 15% of £80.



## Exercise 6

- In the "Parks and Smencer" sale, which of each pair of offers is **better**:-
  - 25% off or a third off
  - 20% off or  $\frac{3}{4}$  of the original price
  - "Buy one, get one free" or "three for the price of two".
- Place in order, smallest to largest:
  - $\frac{3}{5}$ , 0.45, 70%,  $\frac{2}{3}$
  - 0.21,  $\frac{3}{20}$ , 17%,  $\frac{1}{5}$

**MNU 3-07b:** By applying my knowledge of equivalent fractions and common multiples, I can add and subtract commonly used fractions.

## Exercise 1

- Find :-

(a) $\frac{3}{5} + \frac{1}{5}$	(b) $\frac{2}{9} + \frac{5}{9}$	(c) $\frac{4}{11} + \frac{5}{11}$	(d) $\frac{5}{8} + \frac{1}{8}$
(e) $\frac{9}{10} - \frac{3}{10}$	(f) $\frac{4}{5} - \frac{1}{5}$	(g) $\frac{6}{7} - \frac{3}{7}$	(h) $\frac{5}{13} - \frac{2}{13}$

- Find :-

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

Find :-

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

**MNU 3-07c:** Having used practical, pictorial and written methods to develop my understanding, I can convert between whole or mixed numbers and fractions.

## Exercise 1

- Change each of the following to a mixed number and simplify where possible :-

(a) $\frac{15}{2}$	(b) $\frac{16}{3}$	(c) $\frac{42}{5}$	(d) $\frac{25}{10}$
(e) $\frac{25}{4}$	(f) $\frac{30}{4}$	(g) $\frac{122}{11}$	(h) $\frac{78}{8}$

2. Change each of the following mixed numbers to a top heavy fraction :-

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

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

(c)  $7\frac{3}{5}$

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

(e)  $7\frac{8}{9}$

(f)  $5\frac{11}{12}$

(g)  $10\frac{1}{50}$

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

**MNU 3-08a: I can show how quantities that are related can be increased or decreased proportionally and apply this to solve problems in everyday contexts.**

**Exercise 1**

1. George has a lot of pets. He has 11 mice, 9 goldfish, 4 cats, 3 dogs and a rabbit!



What is the ratio of :-

- (a) mice to goldfish
- (b) goldfish to cats
- (c) dogs to cats
- (d) rabbits to mice ?

2. An orchard has 31 apple trees and 27 pear trees. What is the ratio of :-

- (a) apple trees to pear trees
- (b) pear trees to apple trees
- (c) apple trees to total number of trees
- (d) pear trees to total number of trees ?



3. In December 1999, January 2000 and February 2000, there were 7 rainy days each month.

Write down the ratio of rainy days : dry days for each of these months.

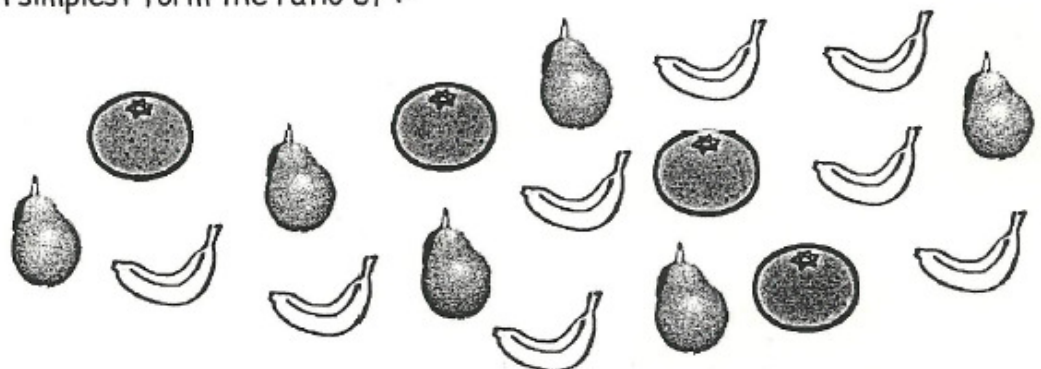
**Exercise 2**

1. Simplify each of the following ratios :-

- (a) 4 : 6
- (b) 5 : 20
- (c) 16 : 2
- (d) 3 : 12
- (e) 10 : 50
- (f) 15 : 35
- (g) 60 : 24
- (h) 21 : 35
- (i) 300 : 9000
- (j) 18 : 270
- (k) 32 : 88
- (l) 17 : 51


2. From the picture, write in simplest form the ratio of :-

- (a) oranges to pears
- (b) bananas to pears
- (c) pears to bananas
- (d) pears to oranges
- (e) bananas to fruit.



3. On a trip to D & M's there were 8 teachers and 120 pupils. Write in simplest form, the ratio of :-

- (a) teachers:pupils
- (b) pupils:teachers
- (c) teachers:people
- (d) people:pupils.

4. At the school disco there were 12 teachers, 160 boys and 180 girls.  
In simplest form write the ratio of :-  
(a) teachers:boys (b) boys:girls (c) girls:teachers (d) boys:total attended.
5. Farmer Jackson knows you need 4 sheepdogs for every 90 sheep.   
(a) Write in simplest form the ratio of sheep:sheepdogs  
(b) Farmer Jones has 135 sheep. How many sheepdogs should farmer Jones have ?
6. Gordon has 32 squidgies, Tom has 16, Ian has 24 and Mary has 12.  
Write down the ratio of squidgies in their simplest form for :-  
(a) Gordon : Mary (b) Tom : Ian (c) Mary : Tom  
(d) Ian : Gordon (e) Boys' squidgies : girl's squidgies (f) Gordon and Tom : Ian and Mary.

### Exercise 3

1. On a bus the ratio of men to women is 1 : 3.  
If there are 8 men on the bus, how many women are there ?  
A fish farm has pike and tench in a 4 : 5 ratio.  
If there are 250 tench, how many pike are there ?
2. The ratio of diesel to petrol cars in a car park is 3 : 5.  
(a) How many petrol cars are there if there are :-  
(i) 6 diesel cars (ii) 15 diesel cars (iii) 27 diesel cars ?  
(b) How many diesel cars are there if there are :-  
(i) 15 petrol cars (ii) 50 petrol cars (iii) 60 petrol cars ?



3. The local curry shop makes curries to different strengths.  
Which strength of curry is made from :-  
(a) 7 teaspoons of powder and 1 tablespoon of paste.  
(b) 10 teaspoons of powder and 6 tablespoon of paste.  
(c) 6 teaspoons of powder and 22 tablespoon of paste.  
(d) 8 teaspoons of powder and 20 tablespoon of paste.  
(e) 9 tablespoons of paste and 15 teaspoon of powder.  
(f) Aji needs to make a large pot of vindaloo and has 24  
tablespoons of paste. How much powder does he need ?



Mix in the ratio

Strength	Curry Powder : Paste
Tindaloo !	7 : 1
Vindaloo	7 : 2
Madras	5 : 3
Medium	2 : 5
Mild	3 : 11

4. In an orchard the ratio of red apples to green apples is 7 : 4. If there are :-  
(a) 21 red apples, how many are green ? (b) 84 red apples, how many are green ?  
(c) 32 green apples, how many are red ? (d) 52 green apples, how many are red ?

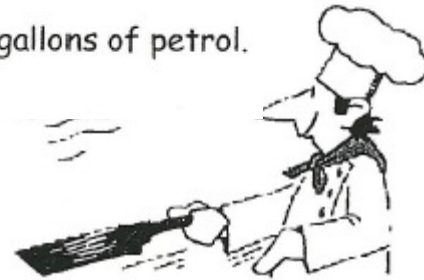
## Exercise 4

- Share £150 between Marc and May in the ratio 2 : 1.  
Bill and Bob win a lottery and share £1000 in the ratio 5 : 3. How much will each receive ?
- Share the following in the ratio given :-
  - \$300 between George and Jim in a 3 : 7 ratio.
  - £20 000 between Carina and Hilary in a 3 : 2 ratio.
  - £2790 between Pat and Mick in a 5 : 4 ratio.
  - A million pounds between James and Pauline in a 7 : 13 ratio.



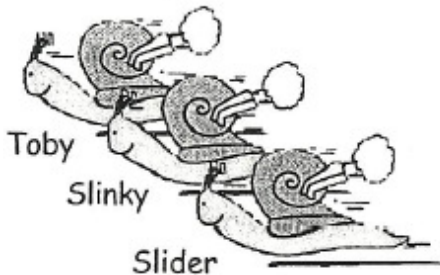
## Exercise 5

- A car travelled a distance of 200 miles on 10 gallons of petrol.  
Calculate the rate in "miles per gallon".
- A chef makes 39 pancakes in 13 minutes.  
Calculate the rate of pancakes/minute.



- In the slug race final,

Toby travelled 100 centimetres in 5 minutes,  
Slinky travelled 66 centimetres in 3 minutes,  
Slider travelled 70 centimetres in  $3\frac{1}{2}$  minutes.



- For each slug, find the speed in centimetres/minute.
- Who was the fastest slug ?

- 5 comics cost £6.25. What would 4 cost ?
- 8 litres of petrol cost £5.68. What would 9 litres cost ?
- $15\text{ cm}^3$  of gold weighs 285 grams. What would  $16\text{ cm}^3$  weigh ?
- A three kilogram roast of beef takes  $2\frac{1}{2}$  hours to cook.  
How long would it take a four kilogram roast. (hint: *change time to minutes*).



**MNU 3-09a:** When considering how to spend my money, I can source, compare and contrast different contracts and services, discuss their advantages and disadvantages, and explain which offer best value to me

## Exercise 1

- John and Rhona put their combined savings of £6 000 into THE REGAL BANK where there is an annual interest rate of 4%.  
How much interest do they receive after 1 year ?



2. Some friends compare the interest they are due from various banks and building societies for 1 year.

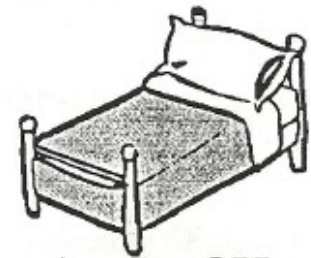
- (a) Dave left £4500 for a year. Rate = 5% p.a.
- (b) George deposited £10500 for a year. Rate = 3.5% p.a.
- (c) Jemma banked £15200 for a year. Rate = 5.5% p.a.
- (d) Mary invested £7120 for a year. Rate = 4.2% p.a.

Calculate how much interest each person was due.

3. A new bed from the "BED SHED" costs £475.

I buy the bed using their Hire Purchase plan shown.

- (a) How much EXTRA does this cost me ?
- (b) Explain your answer.



deposit - £55  
+ 12 payments of £35

**MNU 3-09b: I can budget effectively, making use of technology and other methods, to manage money and plan for future expenses.**

### Exercise 1

1. How many :

- (a) Japanese Yen would I get for £80 ?
- (b) Pesos for £250 ?
- (c) Rupees for £180 ?
- (d) Kroner for £80 ?
- (e) Swiss Francs for £450 ?
- (f) American dollars for £99 ?



2. Jason priced a new bicycle in 4 countries.

£140, 1600 Kroner, 200€, or 10 000 Rupees.

Which is the best deal ?

#### Exchange Rates: £1 =

American Dollar (\$)	1.62
Chinese Yuan	10.27
Danish Krone	9.24
Euro (€)	1.24
Hong Kong Dollar	12.59
Indian Rupee	87.72
Japanese Yen	127.68
Mexican Peso	20.73
Norwegian Kroner	9.28
Swiss Franc	1.51

### Exercise 2

1. Change the following into **British Pounds**:

- (a) € 372
- (b) \$ 810 (American)
- (c) 2361.60 Rupees
- (d) 255360 Yen
- (e) 518.25 Pesos

2. Change the following to pounds sterling. (Give your answer to the nearest penny).  
 (a) 1000 €                      (b) 72 €                      (c) 125 €                      (d) 1880 €
3. A coat costs \$250 in New York. Cathy has £160. Does she have enough money ?
4. I changed £200 into Swiss Francs and spent 136 Francs on holiday.  
 I came home and exchanged the remaining amount into dollars for my next trip to Hong Kong.  
 How many dollars did I receive ?

**MNU 3-10a: Using simple time periods, I can work out how long a journey will take, the speed travelled at or distance covered, using my knowledge of the link between time, speed and distance.**

### Exercise 1

1. Change the following 12 hour clock times to 24 hour clock times :-  
 (a) 2-15 am                      (b) 4-20 am                      (c) 6 am  
 (d) 5-20 pm                      (e) 1-45 pm                      (f) 7 pm  
 (g) 6-25 am                      (h) 9-50 pm                      (i) 1-15 am  
 (j) 10-35 am                      (k) midnight                      (l) 12-20 am
2. Change the following 24 hour clock times to 12 hour clock times :-  
 (a) 0430                      (b) 1040                      (c) 0704  
 (d) 1450                      (e) 1735                      (f) 2050  
 (g) 0150                      (h) 2145                      (i) 2205  
 (j) 1902                      (k) 0000                      (l) 0555
3. How long is it from :-  
 (a) 2-45 pm to 5-45 pm                      (b) 4 am to 8-30 am  
 (c) midnight to 4-30 am                      (d) 7-55 pm to 9-15 pm  
 (e) 3-40 am to 5-10 am                      (f) 4-10 am to 9-35 am ?
4. A show started at 7-35 pm and went on till 10-15 pm.  
 For how long had the show lasted ?
5. I boarded a train at 11-55 am and my journey lasted for 2 hours and 35 minutes.  
 At what time did I reach my destination ?

## Exercise 2

- How far, in miles, will you have covered :-  
(a) running at 9 mph for 2 hours ?    (b) driving at 35 mph for 3 hours ?
- What distances are covered by the following :-  
(a) a truck, travelling for 30 minutes at a speed of 60 m.p.h. ?  
(b) a sail on a yacht for 1 hours 30 minutes, at an average speed of 12 km/hr ?
- What distances are covered by the following :-  
(a) a car, going at an average speed of 36 m.p.h., for  $\frac{1}{4}$  of an hour ?  
(b) a marathon runner, running at a speed of 16 km/hr for 1 hour 45 minutes ?
- A ship left Plymouth at 0215 and arrived at Cherbourg in France at 0745.  
The ship sailed at an average speed of 30 km/hr.  
How long did the sail take and how many kilometres had the ship travelled ?

## Exercise 3

- Calculate the average speed for these journeys :-  
(a) 24 miles travelled in 2 hours.                      (b) 42 km travelled in 6 hours.  
(c) 280 miles travelled in 4 hours.                      (d) 1000 km travelled in 40 hours  
(e) 35 000 miles travelled in 7 hours.                      (f) 180 000 km travelled in 3 hours.
- Find the average speed of :-  
(a) a bus travelling 20 miles in 30 minutes.    (how far does it travel in 1 hour ?)  
(b) a man walking 2 miles in  $\frac{1}{2}$  hour  
(c) a camel crossing the 6 miles of dessert in  $\frac{1}{2}$  hour !  
(d) a train which travels 20 miles in  $\frac{1}{4}$  hour.  
(e) a cyclist covers 30 km in 1 hour 30 minutes. ( $1\frac{1}{2}$  hrs)



## Exercise 4

- Calculate the time taken for each of these journeys :-  
(a) sailing 20 km at 10 km/hr.                      (b) driving 400 miles at 50 m.p.h.  
(c) running 400 m at 8 m/sec.                      (d) flying 700 km at 200 km/hr.

- How long, in hours and minutes, did the following journeys take :-
  - a lorry, travelling 45 km at an average speed of 30 km/hr ?
  - a coach, travelling 150 miles at an average speed of 60 m.p.h. ?

3. (a) Use this distance chart to find how far it is from :-

- Zarat to Fharr
- Khumley to Hartoom.

Zarat			
120	Khumley		
180	80	Hartoom	
210	100	60	Fharr

*distances in km*

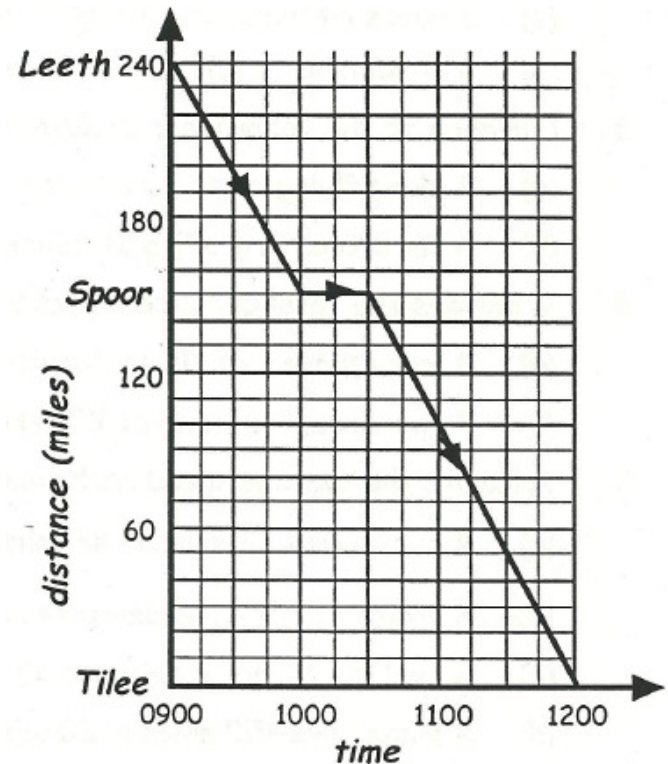
(b) A Land-Rover averages 45 km/hr in the desert. How long would it take to drive from Zarat to Hartoom ?

### Exercise 5

- A motor-cyclist covered a distance of 35 miles in half an hour. What was his average speed ?
- A truck travelled 90 miles at an average speed of 40 miles per hour. How long, in hours and minutes, did it take to complete its journey ?
- A small plane, flying at a steady speed of 240 km/hr, takes  $1\frac{1}{2}$  hours to fly from Downlee Island to the mainland. How far had it flown ?
- It took me  $2\frac{1}{2}$  hours to drive from Harwood to Deefield. Calculate my average speed for the journey.

### Exercise 6

- This graph indicates a pilot's journey in his light plane from Leeth back to Tilee.
  - How long did it take to fly from Leeth to Spoor ?
  - How long did he stop in Spoor ?
  - At what time did he set off from Spoor to head to Tilee ?
  - When did he arrive in Tilee ?
  - Calculate the speed of the plane :-
    - from Leeth to Spoor.
    - on the runway at Spoor.
    - from Spoor to Tilee.

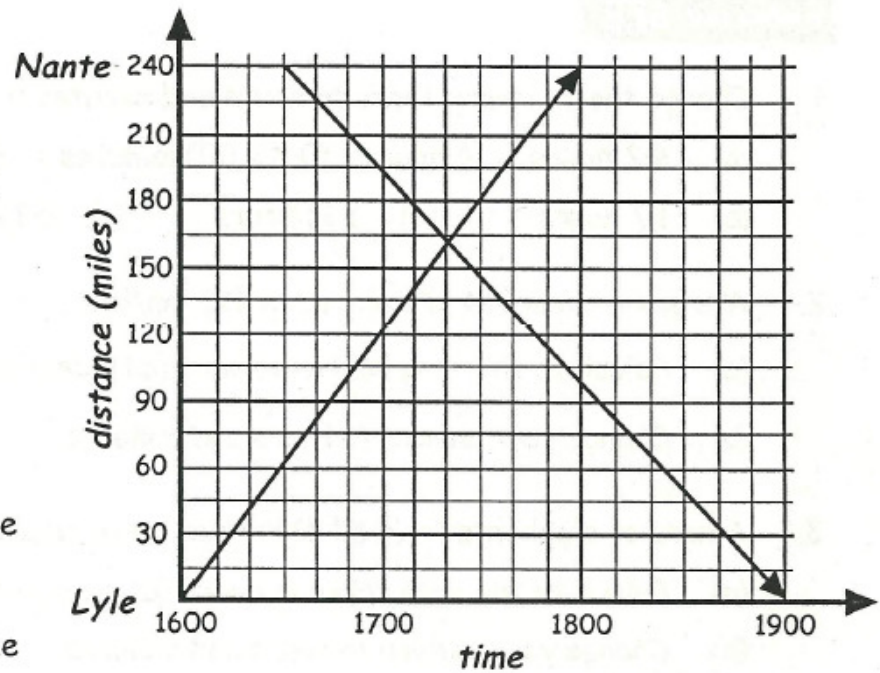




2. A train leaves Lyle in France and heads off to Nante at 1600.

The 1630 train leaves Nante and heads towards Lyle.

- How far is it from Lyle to Nante ?
- At what time do the two trains pass each other ?
- Calculate the speed of the 1600 train from Lyle.
- Calculate the speed of the 1630 train from Nante.



**MNU 3-11a: I can solve practical problems by applying my knowledge of measure, choosing appropriate units and degree of accuracy for the task and using a formula to calculate area or volume when required**

### Exercise 1

1. Change :-

- |                 |                   |                    |
|-----------------|-------------------|--------------------|
| (a) 5 cm to mm  | (b) 1.8 cm to mm  | (c) 15 km to m     |
| (d) 10 m to cm  | (e) 1.5 km to m   | (f) 5.5 cm to mm   |
| (g) 8.6 m to cm | (h) 15.1 cm to mm | (i) 10.05 cm to mm |
| (j) 7.5 km to m | (k) 0.1 m to mm   | (l) 0.001 km to mm |

2. Which is the shortest in each of the following sets of distances :-

- |                                  |  |
|----------------------------------|--|
| (a) 0.5 km, 300 m or 4000 cm     | (b) 100 000 mm, 5000 m or 10 km        |
| (c) 0.0001 km, 0.11 m or 10.1 cm | (d) 1 million mm, 100 001 cm or 1 km ? |

3. A 4.5 metre length of wood is cut in **three** places such that all the pieces are of the same length.

What is the length of each piece in millimetres.



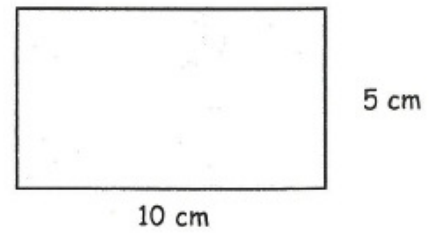
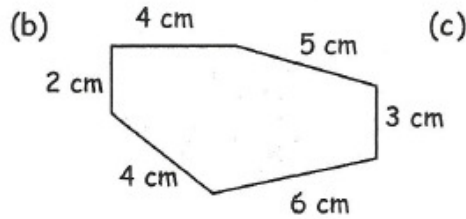
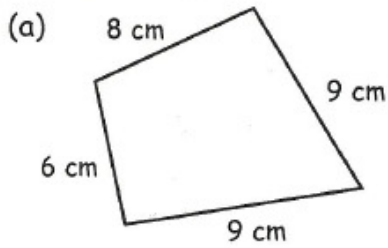
4. Alf came 2nd in the 100 metre race. A video "close-up" showed that he had run 96.7 metres when the winner had crossed the line.

How many centimetres was Alf behind the winner ?



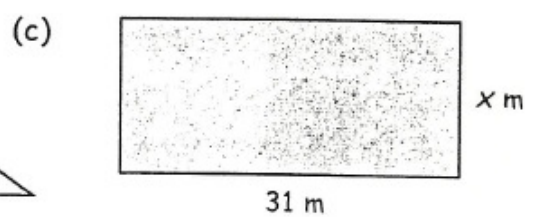
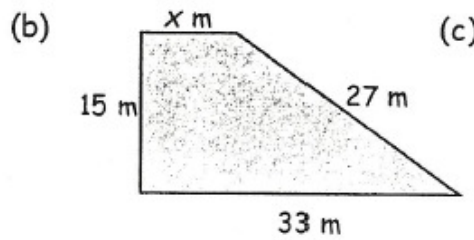
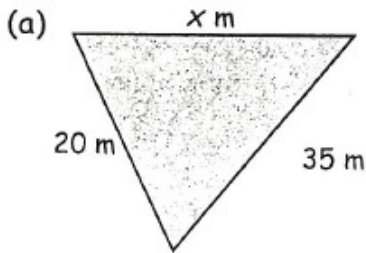
## Exercise 2

1. Calculate the perimeter of each of the following shapes :-



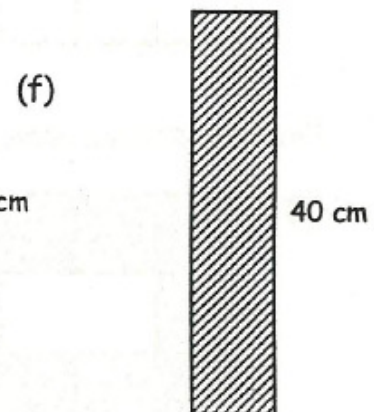
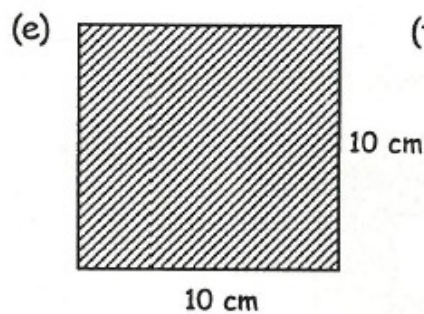
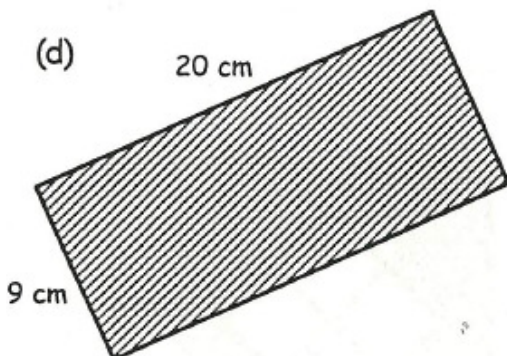
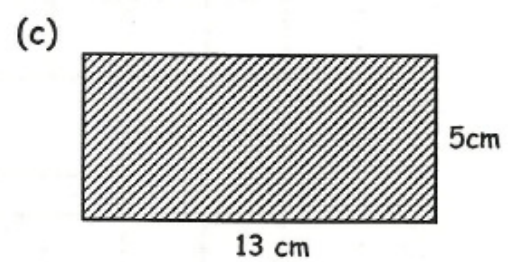
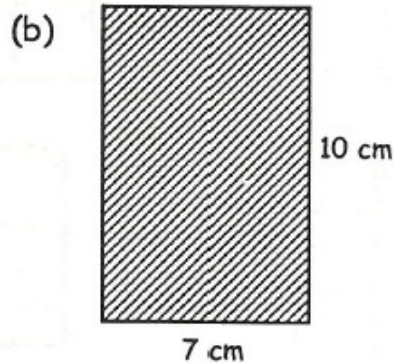
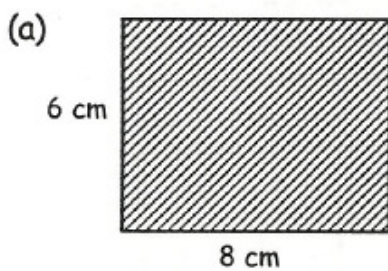
2. Each of these shapes has a perimeter of 80 metres.

Calculate the length of the sides marked  $x$ .



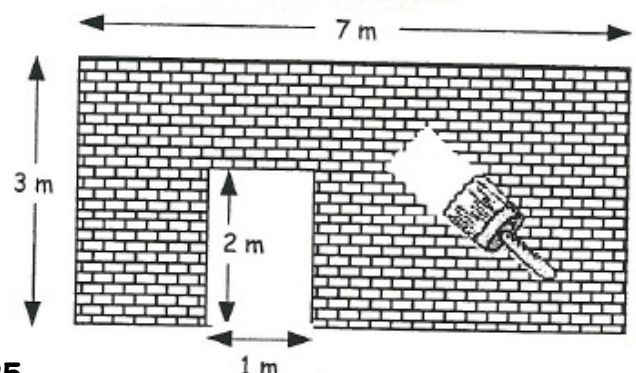
## Exercise 3

1. Calculate the area of each of the following rectangles.



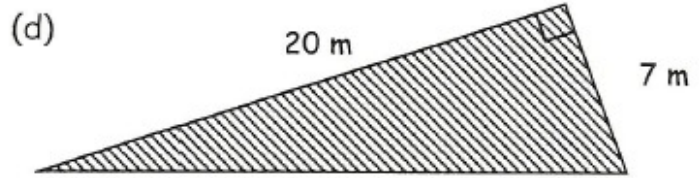
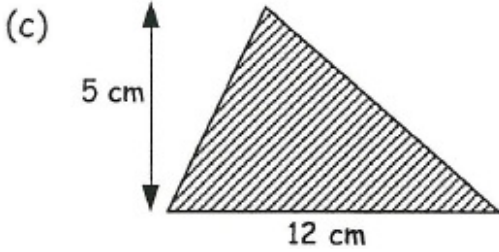
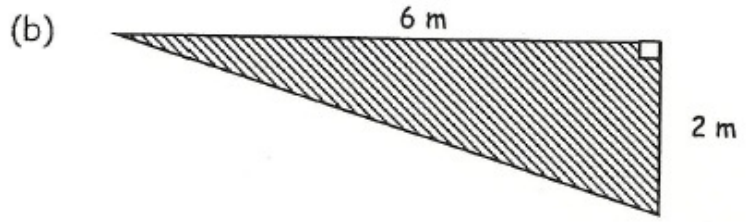
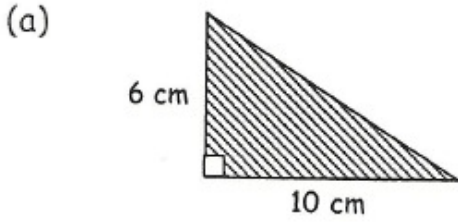
2. A wall is to be painted. A litre of paint will cover  $4 \text{ m}^2$  and costs £4.50.

- (a) Calculate the area of the doorway.  
 (b) Calculate the area of the wall to be painted.  
 (c) How much will it cost to paint the wall?

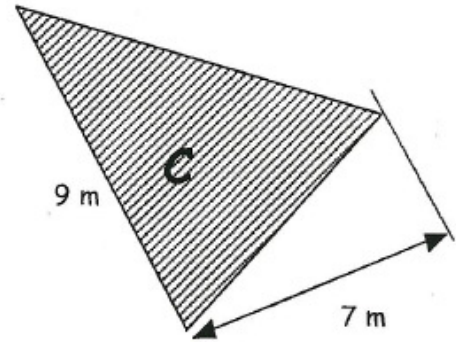
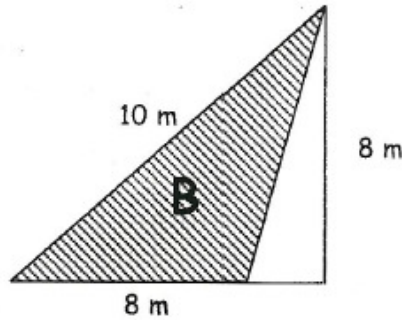
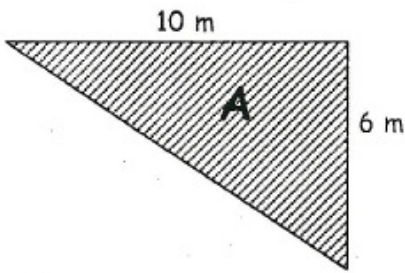


### Exercise 4

1. Find the area of each of the triangles :-

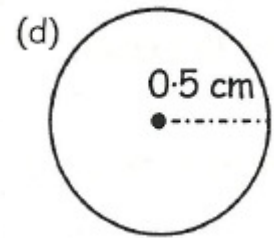
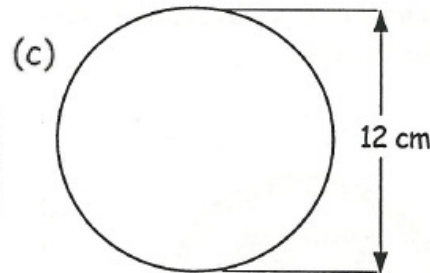
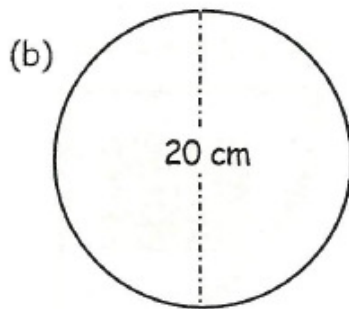
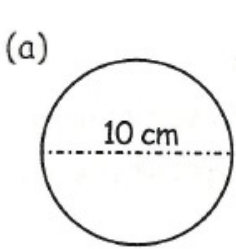


2. Which of the three triangles has the smallest area :-



### Exercise 5

1. Calculate the circumference of each circle below:-

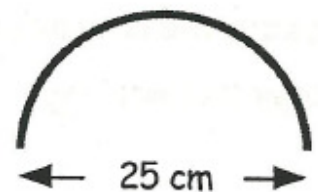


This motorway sign has a diameter of 62 centimetres. Calculate its circumference.

3. Bert buys a stick of licorice and bends it into the shape of a semi-circle.

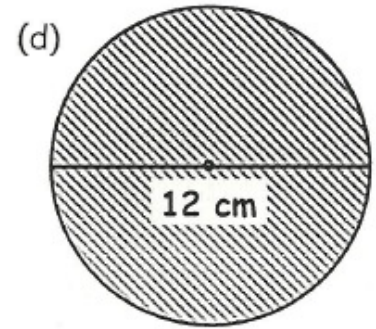
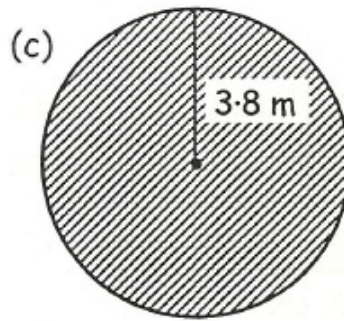
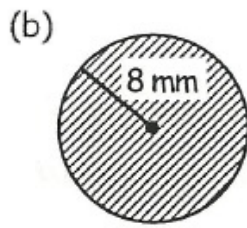
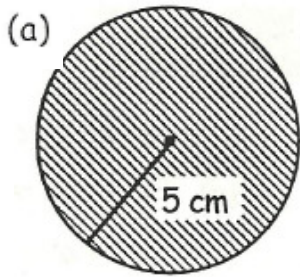
The diameter of the semi-circle is 25 centimetres.

Calculate the length of the licorice stick.



## Exercise 6

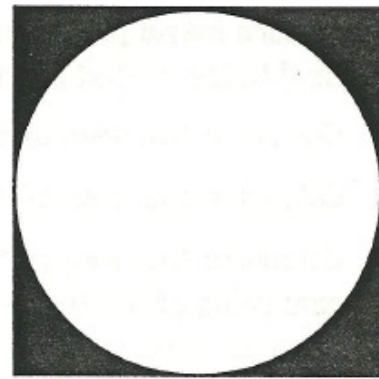
1. For following circles, calculate their areas :-



The radius of this gold medal is 2.1 cm.  
Calculate the area of the gold face.

3. This circle just fits into this square.

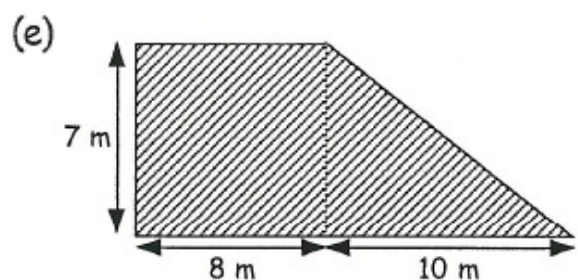
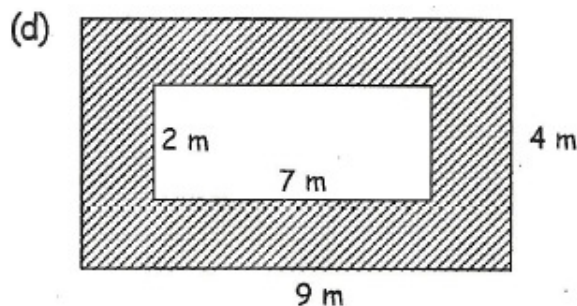
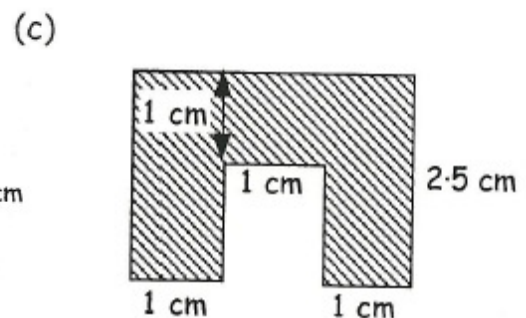
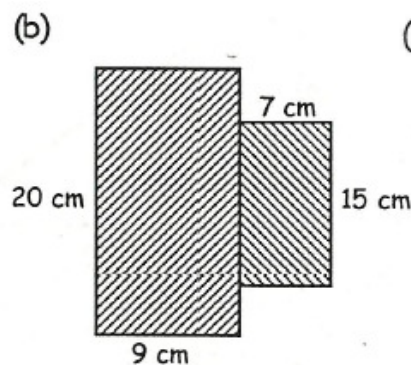
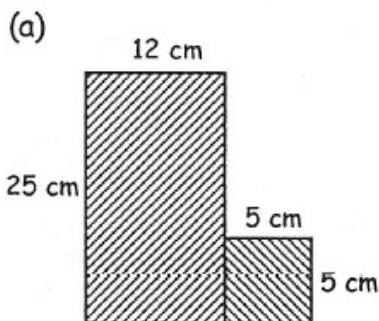
- What is the DIAMETER of the circle?
- Calculate the area of the circle.
- Calculate the area of the big square.
- Now use your answers to (b) and (c) to calculate the shaded area in the figure.

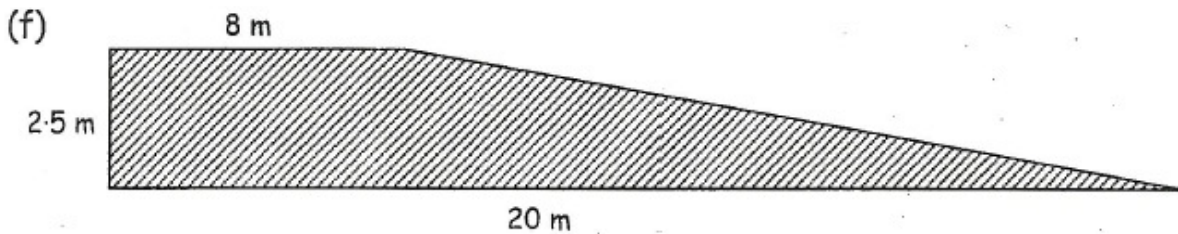


12 cm

## Exercise 7

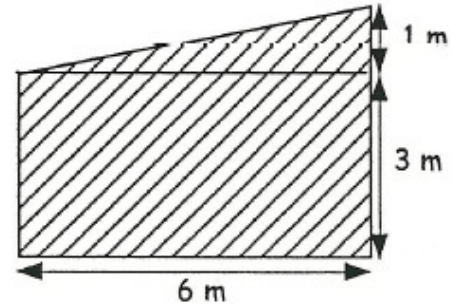
1. Calculate the **total shaded area** of each shape below:-





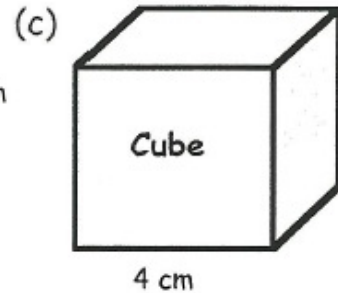
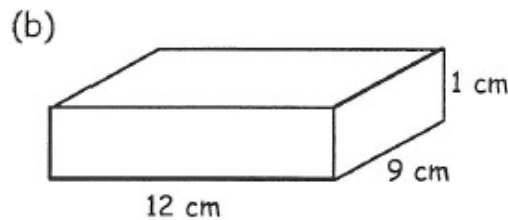
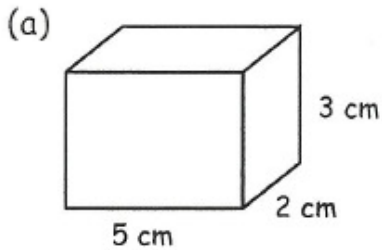
2. The side of a house is to be painted. The paint costs £6.25 a litre and one litre will cover an area of eight square metres.

How much will it cost to paint the side of the house?

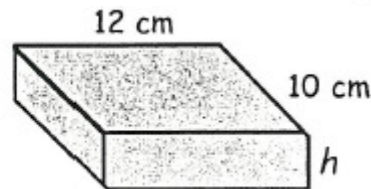


### Exercise 8

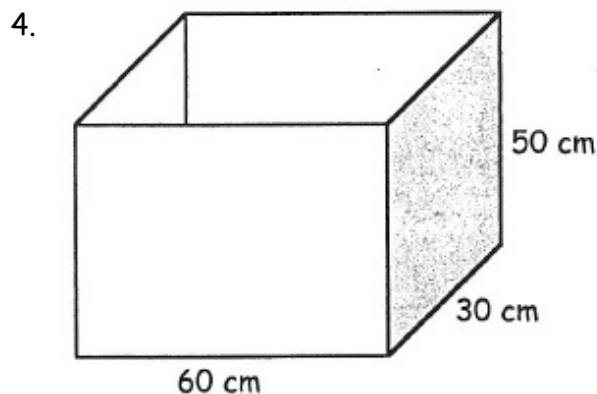
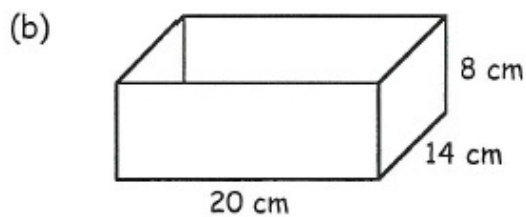
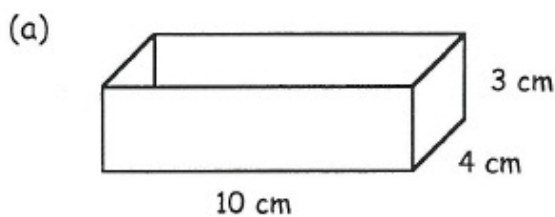
1. Use the formula to calculate the volume of each of the following cuboids :-



2. The volume of the box shown is  $360 \text{ cm}^3$ . Find the height of the box.



3. Calculate the volume of each ( $\text{cm}^3$ ) and write how many millilitres each will hold when full.



An empty aquarium has dimensions as shown.

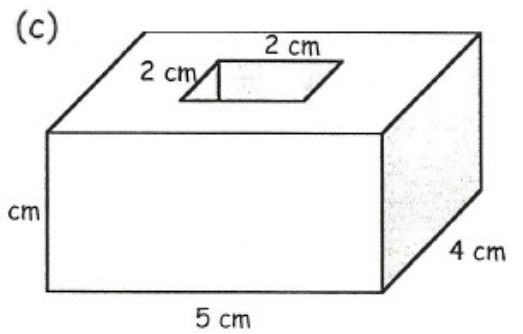
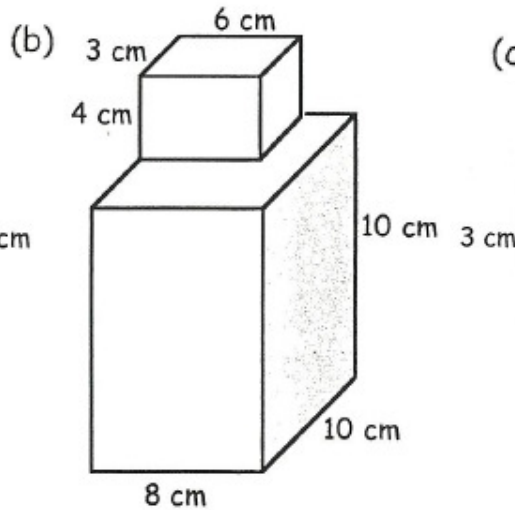
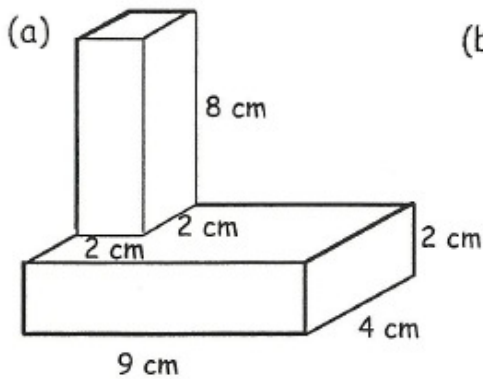
The tank must be at least **three quarters** full of water for the fish to survive.

What is the minimum volume of water that must be poured into the tank?

(Answer in litres)

## Exercise 9

1. Find the total volume of the following shapes :-



**MNU 3-13a:** Having explored number sequences, I can establish the set of numbers generated by a given rule and determine a rule for a given sequence, expressing it using appropriate notation

## Exercise 1

1. Give a possible rule for each of these sequences :-

- |                          |                               |
|--------------------------|-------------------------------|
| (a) 2, 4, 6, 8, ...      | (b) 5, 10, 15, 20, ...        |
| (c) 3, 6, 12, 24, ...    | (d) 1, 3, 9, 27, 81, ...      |
| (e) 64, 32, 16, 8, ...   | (f) 11, 7, 3, -1, -5, ...     |
| (g) 100, 10, 1, 0.1, ... | (h) 4, 6, 9, 13.5, 20.25, ... |

2. Write the next 3 numbers in each sequence :-

- |                          |                                   |
|--------------------------|-----------------------------------|
| (a) 11, 14, 17, 20, ...  | (b) 4, 8, 16, 32, ...             |
| (c) 40, 20, 10, ...      | (d) 100 000, 10000, 1000, ...     |
| (e) 76, 65, 54, 43, ...  | (f) 5, 6, 8, 11, 15, ...          |
| (g) 1, 4, 9, 16, 25, ... | (h) 1, 1, 2, 3, 5, 8, 13, 21, ... |
| (i) 1, 3, 6, 10, 15, ... | (j) 2, 3, 5, 7, 11, 13, 17, ...   |

3. List all the square numbers from 100 to 300.

- Find :-
- |                  |                  |                      |
|------------------|------------------|----------------------|
| (a) $\sqrt{64}$  | (b) $\sqrt{49}$  | (c) $\sqrt{144}$     |
| (d) $\sqrt{121}$ | (e) $\sqrt{625}$ | (f) $\sqrt{10000}$ . |

## Exercise 2

1. (a) Copy and complete this table, showing the number of legs on the spiders .

No. of spiders ( $S$ )	1	2	3	4	5	6
No. of legs ( $L$ )	8	?	?	?	?	?



- (b) Copy and complete :- "the total number of legs = ? x the number of spiders".  
 (c) Write the formula using symbols connecting  $L$  and  $S$ .  
 (d) Use this "rule" to find the number of legs on 13 spiders.  
 (e) How many legs on 21 spiders ?

2. (a) Determine a formula or rule connecting the two letters.

No. of starfish ( $S$ )	1	2	3	4	5	6
No. of legs ( $L$ )	5	?	?	?	?	?



- (b) Find the number of legs for 13 starfish.

3. (a) Determine a formula or rule connecting the two letters.

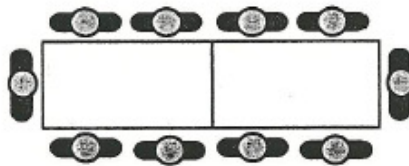
No. of tricycles ( $T$ )	1	2	3	4	5	6
No. of wheels ( $W$ )	3	?	?	?	?	?



- (b) Find the number of wheels for 17 tricycles.

## Exercise 3

1. A rectangular table seats 6 people, two tables seat 10, three tables seat .....



- (a) Copy and complete the table.

No. of tables ( $T$ )	1	2	3	4	5	6
No. of people ( $P$ )	6	?	?	?	?	?

- (b) Write a formula using symbols. ( $P = \dots \times T + \dots$ )  
 (c) Use the formula to find how many people can sit at 12 tables.

2. (a) Copy and complete the table of van hire charges.

No. of days (D)	1	2	3	4	5	6
No. of £ (P)	28	38	?	?	?	?



HIRE-IT-ALL  
£18 to Hire  
+  
£10 per day

- (b) Write a formula using symbols.  
(c) Use the formula to find the cost of hiring a van for 2 weeks.
3. Write a formula connecting the pairs of letters in each of the tables below :-



(a)

Days (D)	1	2	3	4
Hire cost (H)	20	25	30	35

(b)

Fish (F)	1	2	3	4
Litres (L)	25	53	81	109

(c)

Breaths (B)	5	6	7	8
Heartbeat (H)	15	19	23	27

(d)

(x)	2	4	6	8
(y)	15	25	35	45

**MNU 3-14a: I can collect like algebraic terms, simplify expressions and evaluate using substitution.**

### Exercise 1

1. Copy and simplify :-

(a)  $8x + 4x$

(b)  $3y - 2y$

(c)  $9h + h$

(d)  $12p - p$

(e)  $5x + 3x + 4x$

(f)  $9w + 5w + w$

(g)  $c + c + c$

(h)  $8k + 5k - 10k$

(i)  $15q + 9q - 19q$

(j)  $83d + 22d - 91d$

(k)  $20z - 17z + z$

(l)  $31h - 25h - 6h$

2. Copy and simplify :-

(a)  $18x + 14x - 27x$

(b)  $7y - y + 8y$

(c)  $12i + 7i - 14i$

(d)  $26t - t - t - t$

(e)  $v + 11v + 4v - v$

(f)  $90j^2 + 5j^2 - j^2$

(g)  $h + 13h + 12h - 23h$

(h)  $7u + 6u - 12u$

(i)  $5g^2 + 9g^2 - 4g^2$

(j)  $51e^3 + 29e^3 - 79e^3$

(k)  $z - 5z + 7z$

(l)  $31x - 35x - 6x$

### Exercise 2

1. If  $a = 4$  and  $b = 5$ , find the value of :-

(a)  $a + b$

(b)  $a - b$

(c)  $ab$

(d)  $5a - 3b$

(e)  $8b \div 4$

(f)  $7a \div 2$

(g)  $4ab \div 20$

(h)  $ab \div 40$



2. For  $w = 2$ ,  $x = 3$ ,  $y = 1$  and  $z = 6$ , calculate :-

- |                   |                     |                         |                          |
|-------------------|---------------------|-------------------------|--------------------------|
| (a) $2w + 3 + x$  | (b) $1 + 2z - 2x$   | (c) $5y + 2w$           | (d) $30 - 5z$            |
| (e) $z - 3w + y$  | (f) $w + 3x - y$    | (g) $2wx - 2$           | (h) $25 - 3yz$           |
| (i) $2z + 4y - x$ | (j) $2x - 4y + 2w$  | (k) $\frac{1}{3}wz + x$ | (l) $\frac{1}{4}zw - xy$ |
| (m) $10 - 2z + y$ | (n) $5 + 3yw - wzy$ | (o) $2y - 5w + z$       | (p) $72 - 2wxyz$         |

3. (a) Find an expression for the total cost of the items shown :-



(b) If  $s = 10$  and  $t = 20$ , what is the total cost ?

4. Find the value of each expression below when  $a = 2$ ,  $b = 3$  and  $c = 4$  :-

- |                       |                      |                       |
|-----------------------|----------------------|-----------------------|
| (a) $a + b - c$       | (b) $2a + 4b - 3c$   | (c) $5b - 4c + a$     |
| (d) $a^2 + b^2 + c^2$ | (e) $(c - a)^2 - 2b$ | (f) $a^3 - (b - c)^3$ |

**MNU 3-15a:** Having discussed ways to express problems or statements using mathematical language, I can construct and use appropriate methods to solve a range of simple equations

### Exercise 1

1. Copy each equation and solve it to find the value of  $x$  :-

- |                  |                   |                   |
|------------------|-------------------|-------------------|
| (a) $x + 7 = 12$ | (b) $x + 12 = 14$ | (c) $11 + x = 23$ |
| (d) $8 - x = 3$  | (e) $x - 2 = 5$   | (f) $x - 12 = 14$ |

2. Copy and solve :-

- |               |               |                |
|---------------|---------------|----------------|
| (a) $2a = 10$ | (b) $3y = 15$ | (c) $9h = 81$  |
| (d) $12p = 0$ | (e) $5x = 75$ | (f) $19w = 76$ |

Find the value of each variable by solving the equations :-

- |                      |                    |                   |
|----------------------|--------------------|-------------------|
| 3. (a) $2x + 4 = 16$ | (b) $3y + 1 = 13$  | (c) $5y + 4 = 9$  |
| (d) $8p - 1 = 23$    | (e) $2x - 7 = 13$  | (f) $9 + 2w = 15$ |
| (g) $7c - 12 = 9$    | (h) $14 - 5g = 4$  | (i) $8 - 3e = 2$  |
| (j) $8 + 4x = 0$     | (k) $12z - 3 = 57$ | (l) $8 - 2a = -2$ |

### Exercise 2

1. Solve the following equations :-

- |                        |                        |                        |
|------------------------|------------------------|------------------------|
| (a) $5x + 3 = 3x + 5$  | (b) $8x + 9 = 7x + 17$ | (c) $7x - 1 = 3x + 15$ |
| (d) $5x - 3 = 2x + 18$ | (e) $12x - 5 = 8x + 7$ | (f) $10x - 1 = 8x + 6$ |

$$(g) 6x + 4 = 3x + 4$$

$$(h) 9x - 1 = 4x + 34$$

$$(i) 7x - 8 = x + 1.$$

2. Solve for  $x$  :-

$$(a) 4x = 3x + 8$$

$$(b) 4x = x + 18$$

$$(c) 9x = 4x + 45$$

$$(d) 10x = 9x + 41$$

$$(e) 3x = x + 17$$

$$(f) 5x - 26 = 3x$$

$$(g) 7x - 48 = x$$

$$(h) 3x + 17 = x$$

$$(i) 10x - 30 = 6x.$$

### Exercise 3

1. Solve :-

$$(a) \frac{1}{2}x = 5$$

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

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

$$(d) \frac{1}{3}x + 1 = 2$$

$$(e) \frac{1}{7}z - 3 = 0$$

$$(f) \frac{1}{10}k - 1 = 1$$

### Exercise 4

1. Solve these inequalities, (leave your answer in form eg.  $x > 3$ ) :-

$$(a) x + 4 > 8$$

$$(b) x - 5 < 7$$

$$(c) h - 4 > 0$$

$$(d) 3f > 15$$

$$(e) 7w \leq 28$$

$$(f) 3c \leq 15$$

$$(g) 2x + 5 < 13$$

$$(h) 5y - 1 \leq 9$$

$$(i) 3g - 1 > 14$$

$$(j) 4x - 6 < -6$$

$$(k) 1 + 3x \leq 6$$

$$(l) 2y - 7 \geq 7$$

2. Three pints of beer cost more than £4.50.

(a) Show this as an inequality using the letter  $p$ .

(b) Solve to find the minimum cost of one pint.



3. Four bags of marbles and ten extra marbles weigh more than 170 grammes.

(a) Write an inequality to show this information.

(b) Solve to find the minimum weight of a bag of marbles.



**MNU 3-15b: I can create and evaluate a simple formula representing information contained in a diagram, problem or statement.**

### Exercise 1

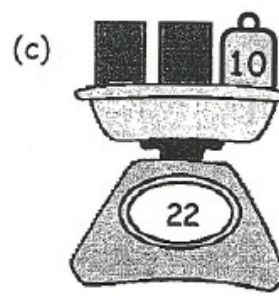
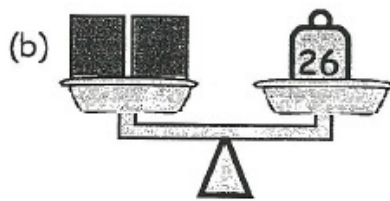
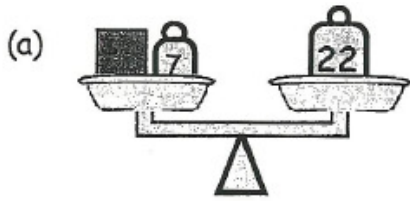
1. Five calculators ( $c$ ) are priced at £6 in total.

(a) Form an equation in  $c$  to show this.

(b) Solve the equation to find the cost of one calculator.



2. For each diagram below:-
- Write an equation which describes the picture
  - Solve to find the value of  $x$ .



3. Gary and Bob weigh a total of 112 kilograms.  
Gary weighs 61 kilograms.

- Make up an equation to show this information.
- Solve the equation to find Bob's weight.

4. (a) Brad had some money in his pocket.  
When he put a further £3.50 in his pocket he then had a total of £9.

Make up an equation and solve it to find how much money Brad had originally.



- Barry shared equally 24 sweets between himself and his three friends.  
Make up an equation and solve it to find how many sweets each person will get.

5. A rectangle with area  $45 \text{ cm}^2$ , has length  $y \text{ cm}$  and breadth  $5 \text{ cm}$ .

- Write an equation to show this information.
- Solve the equation to find  $y$ .

6. Simon had 6 boxes of disks.

Amy had only 1 box of disks but had 50 loose disks as well.

They discovered that they had exactly the same number of disks.

- Make up an equation to show this information.  
(let  $x$  be the number of disks in 1 box)



- Solve the equation to determine how many disks there are in each box.

**MNU 3-16a: Having investigated a range of methods, I can accurately draw 2D shapes using appropriate mathematical instruments and methods**

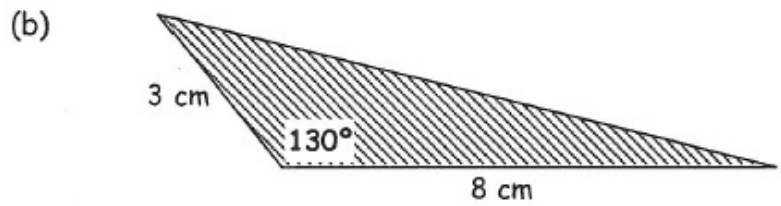
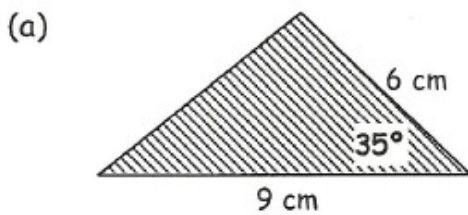
### Exercise 1

- Draw a rhombus with diagonals 10 cm and 6 cm.
- Make three different sketches of rectangles each having a perimeter of 24 cm.
- Make sketches of 3 different rectangles, each of which has an area of  $24 \text{ cm}^2$ .
- Sketch 3 different kites each with diagonals 12 cm and 8 cm.

You will need a **ruler**, **protractor**, and some **compasses** to complete these exercises correctly.

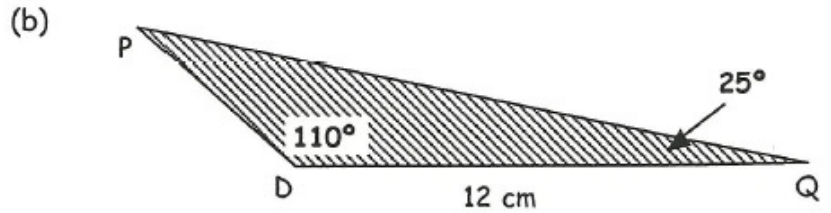
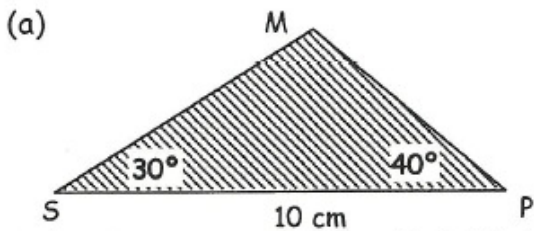
## Exercise 2

1. Make accurate drawings of the following triangles :-



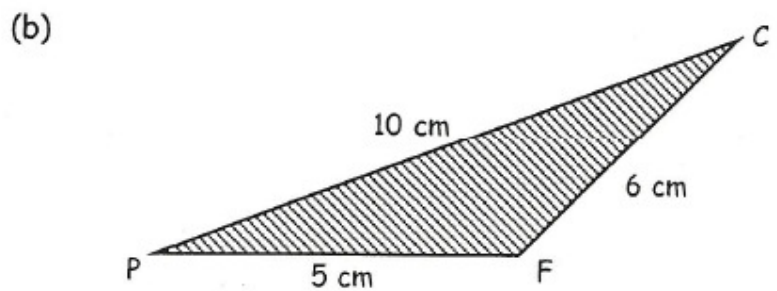
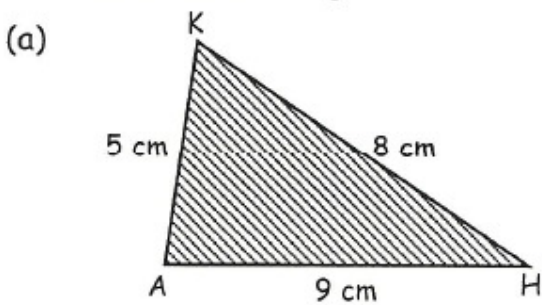
2. Make an accurate drawing of  $\triangle ABC$  where  $AB = 11$  cm,  $BC = 9$  cm and  $\angle ABC = 73^\circ$ .

3. Make accurate drawings of the following triangles :-



4. Make an accurate drawing of  $\triangle DEF$  where  $DE = 10$  cm,  $\angle DEF = 59^\circ$  and  $\angle FDE = 40^\circ$ .

5. Make accurate drawings of the following triangles :-

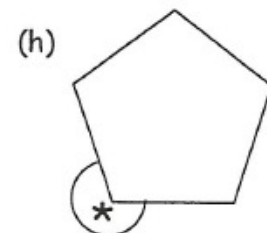
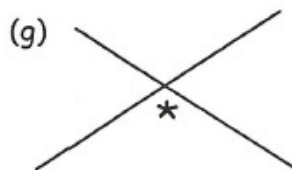
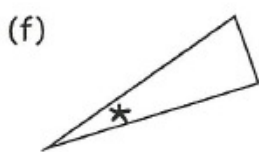
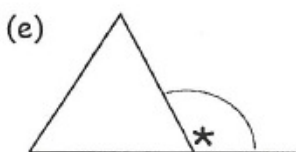
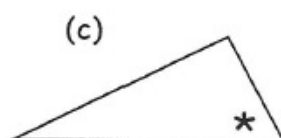
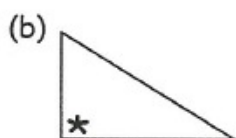
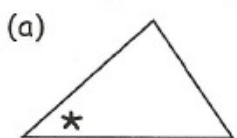


6. Make an accurate drawing of  $\triangle XYZ$  where  $XY = 10$  cm,  $XZ = 9$  cm and  $YZ = 6$  cm.

**MNU 3-17a: I can name angles and find their sizes using my knowledge of the properties of a range of 2D shapes and the angle properties associated with intersecting and parallel lines**

## Exercise 1

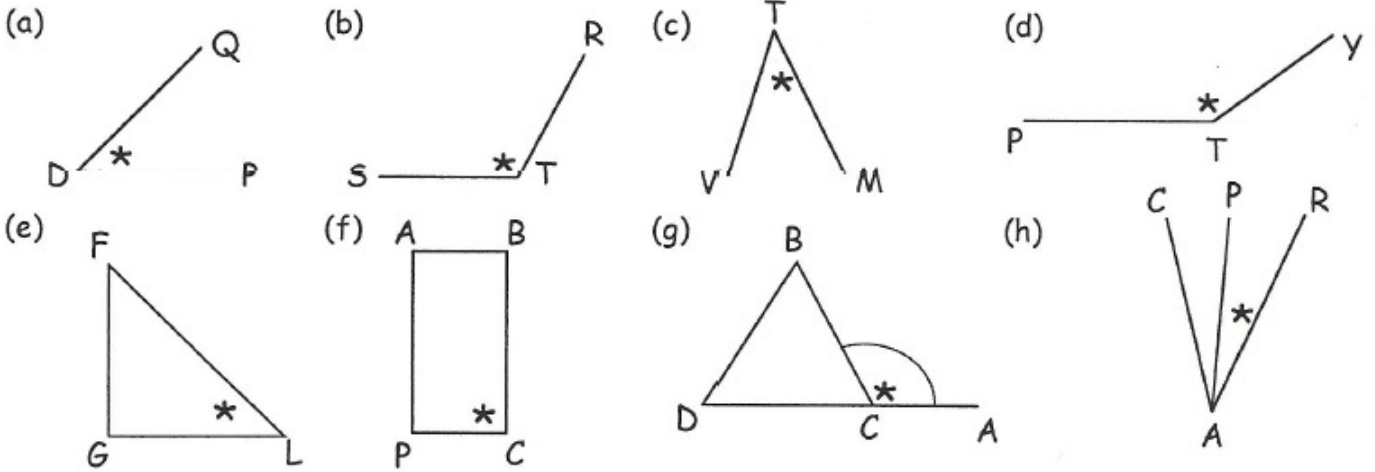
1. What type of angle is marked with \*.



2. Write what type of angle each of the following is :-

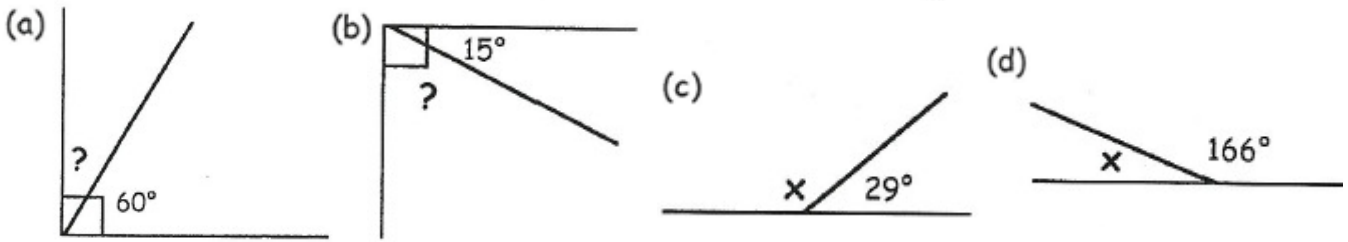
- (a)  $47^\circ$                       (b)  $91^\circ$                       (c)  $176^\circ$                       (d)  $180^\circ$   
 (e)  $190^\circ$                       (f)  $1^\circ$                       (g)  $90^\circ$                       (h)  $270^\circ$ .

3. Use 3 letters to name each of the angles marked with \* .

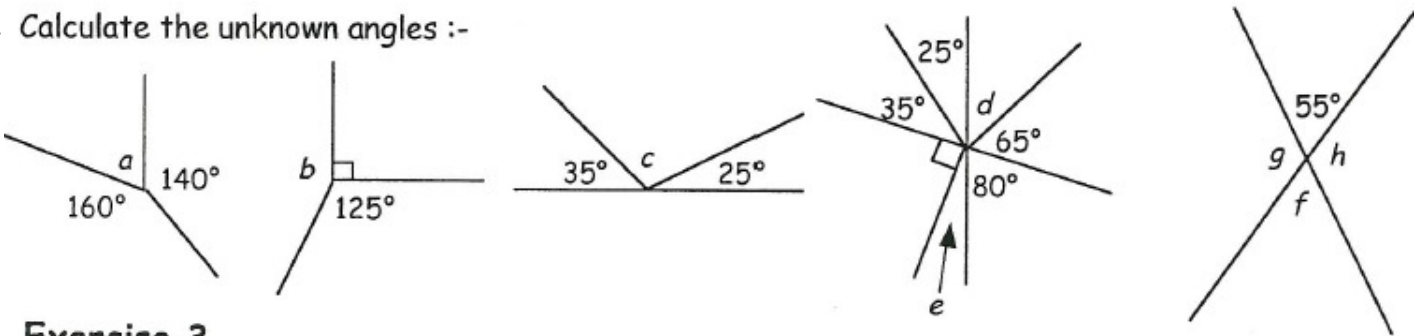


### Exercise 2

1. Calculate the size of the unknown angle in each of the following :-

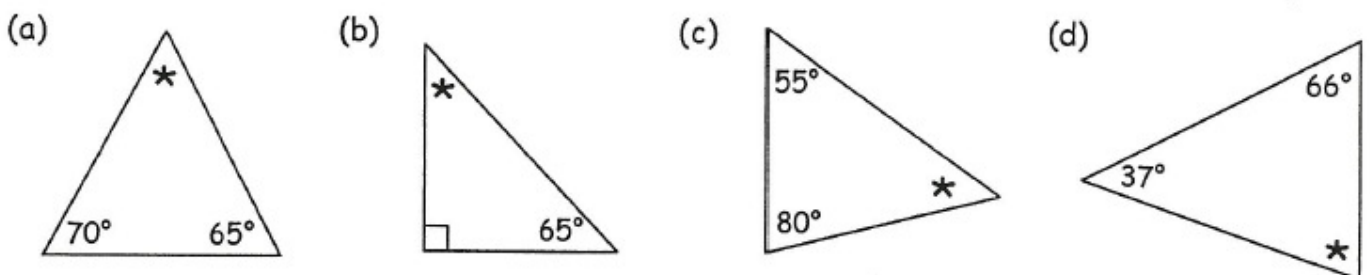


2. Calculate the unknown angles :-



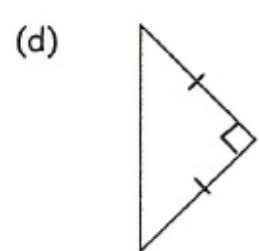
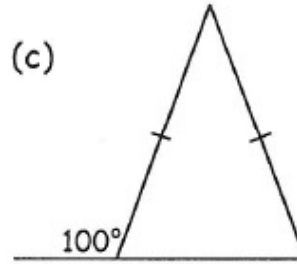
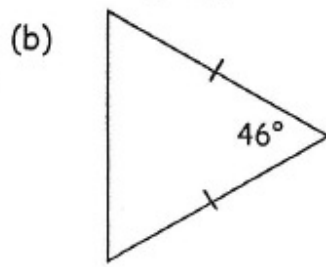
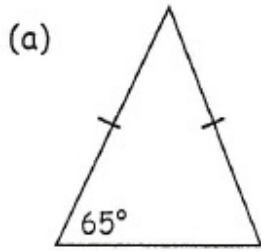
### Exercise 3

1. Calculate the size of the angle marked \* in each of these triangles :-



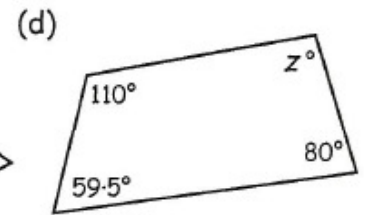
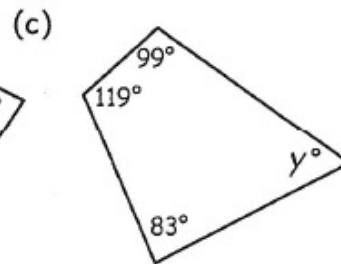
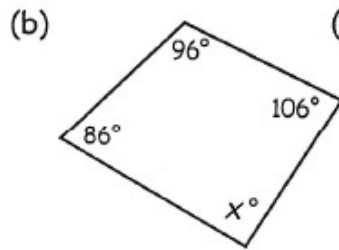
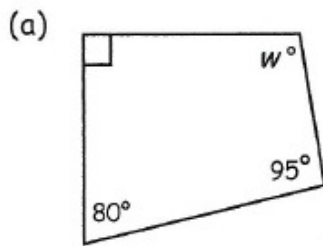
2. Make a neat rough sketch of each of the following diagrams.

Fill in the sizes of all the missing angles.



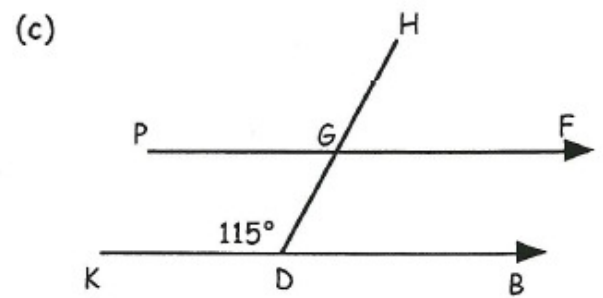
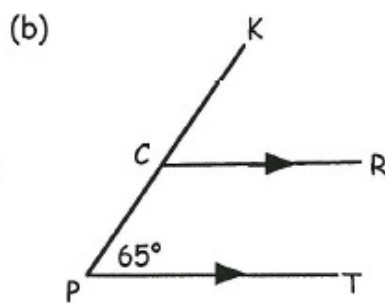
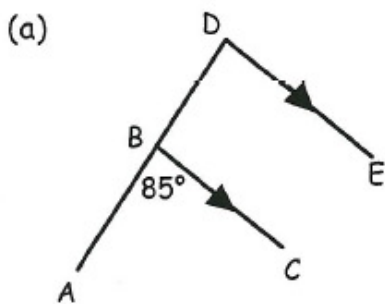
### Exercise 4

1. Calculate the values of  $w$ ,  $x$ ,  $y$  and  $z$  in the following quadrilaterals :-

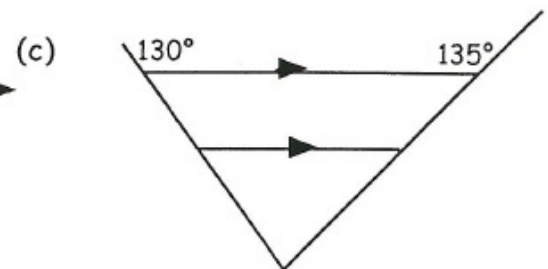
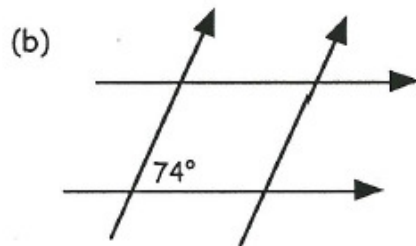
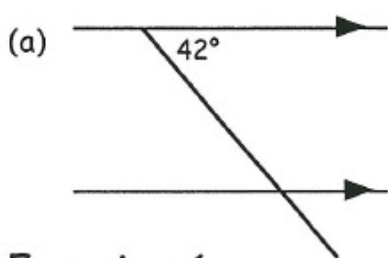


### Exercise 5

1. Sketch each of the following and fill in all the angles :-

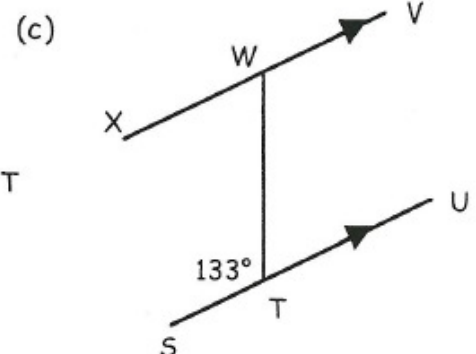
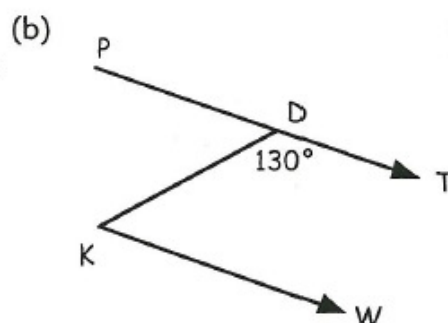
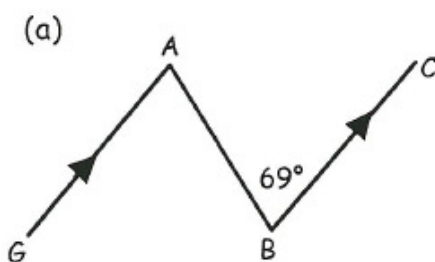


2. Sketch each of the following and fill in all the missing angles :-

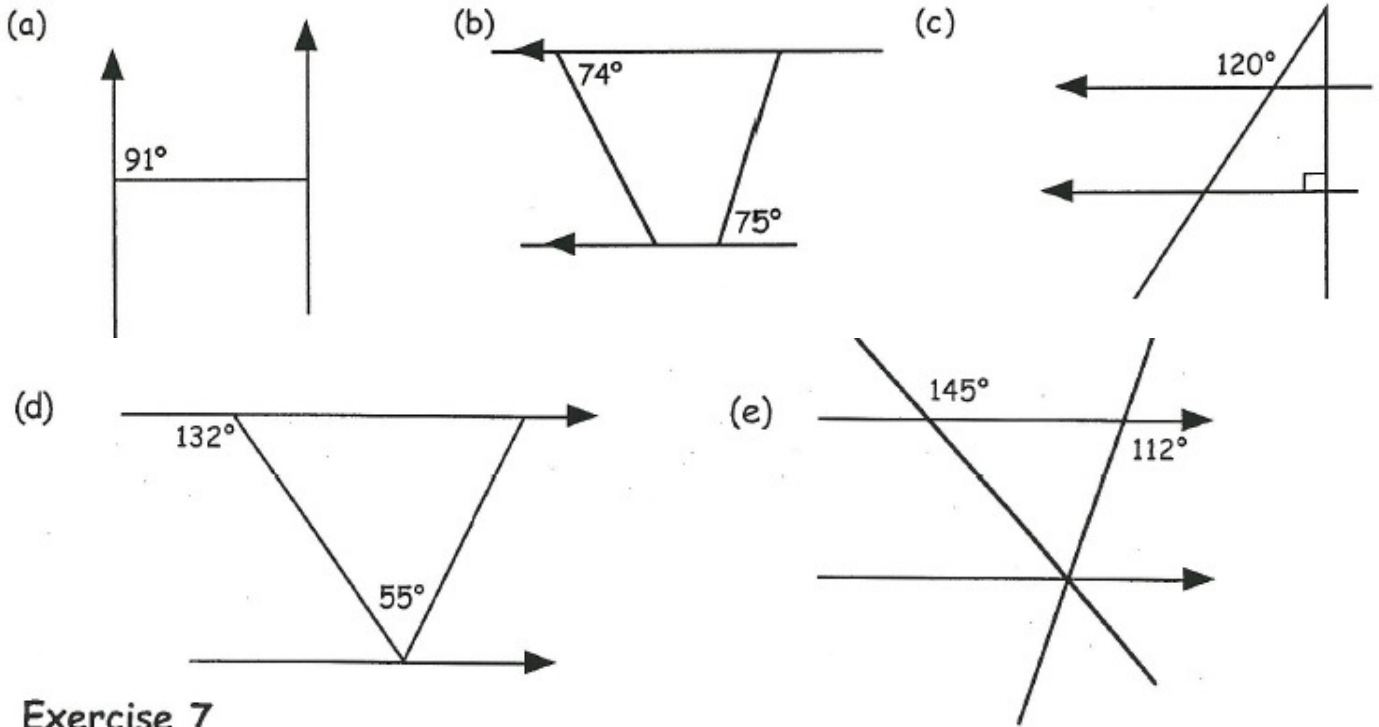


### Exercise 6

1. Sketch each of the following and fill in all the angles :-

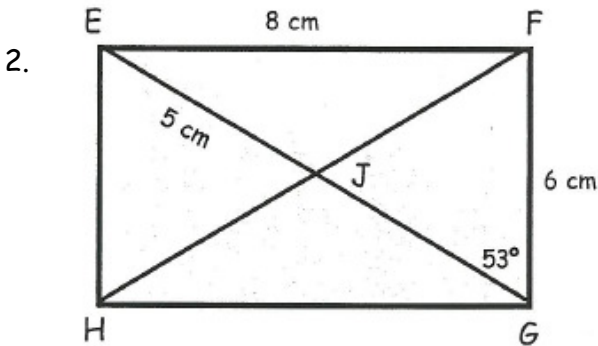
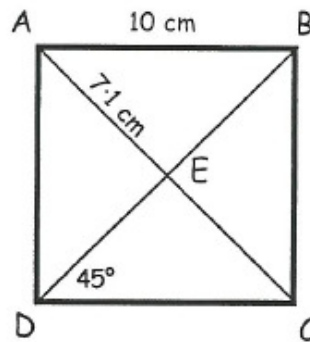


2. Sketch each of the following and fill in all the missing angles :-

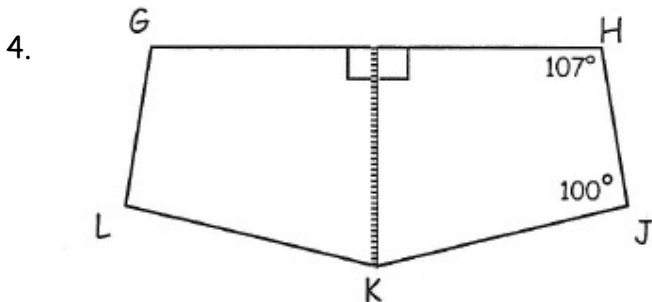
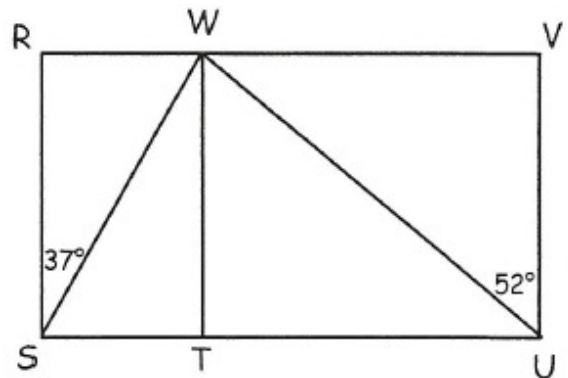


**Exercise 7**

- (a) Make a neat sketch of the square shown.  
 (b) Fill in the sizes of every side and angle.



- In this diagram  $\angle RSW = 37^\circ$  and  $\angle VUW = 52^\circ$ .  
 Make a fairly large sketch of the figure and fill in the sizes of all the angles.

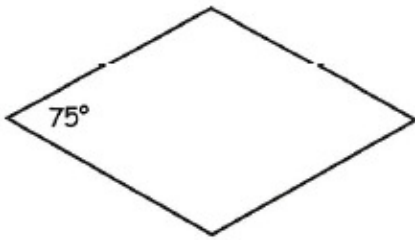


Two congruent quadrilaterals are used to create a shop sign.  
 Calculate the size of angle JKL.

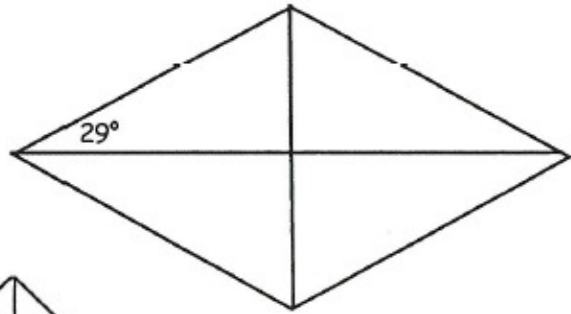
### Exercise 8

1. Sketch each of the following rhombii and fill in the sizes of all the missing angles :-

(a)

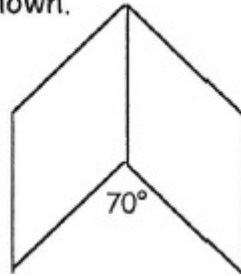


(b)



2. Two identical rhombii are placed as shown.

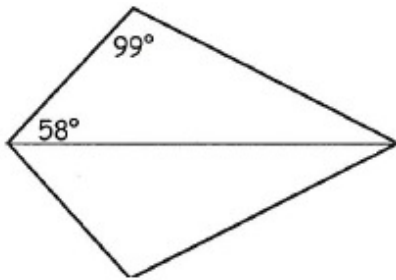
Sketch the diagram and fill in the sizes of all the missing angles.



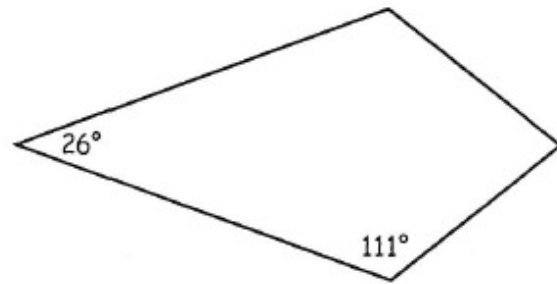
### Exercise 9

1. Sketch each of the following kites and fill in the sizes of the missing angles :-

(a)

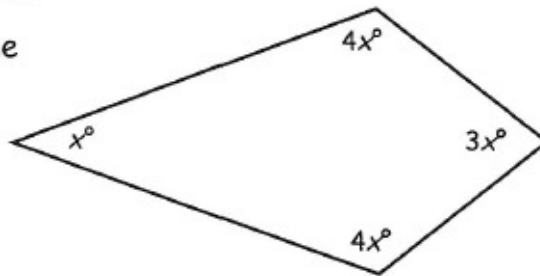


(b)



2. (a) Calculate the value of  $x$  in this kite.

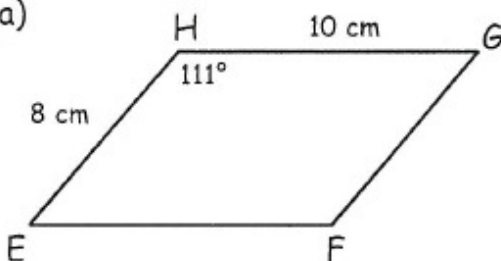
(b) Now sketch the kite and fill in the sizes of all its angles



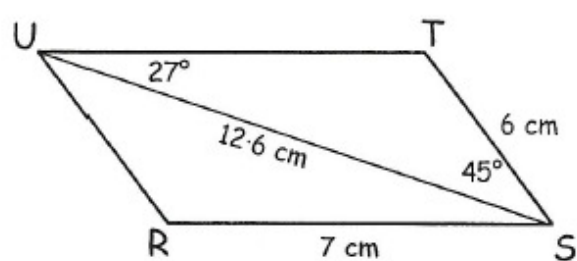
### Exercise 10

Sketch each of the following parallelograms and fill in the sizes of all angles and sides :-

1. (a)

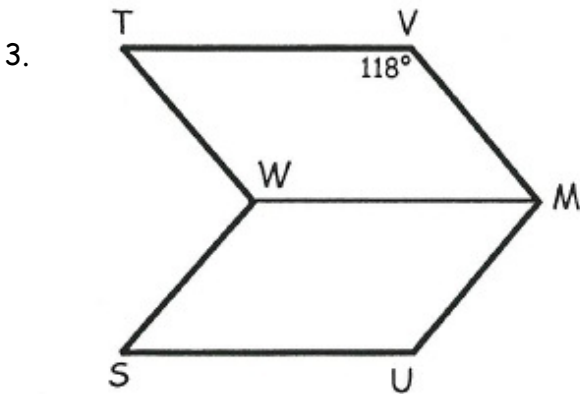
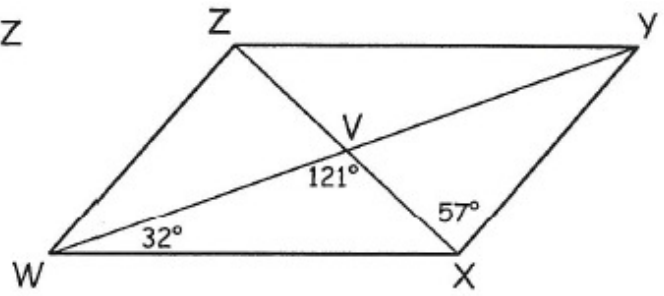


- (b)





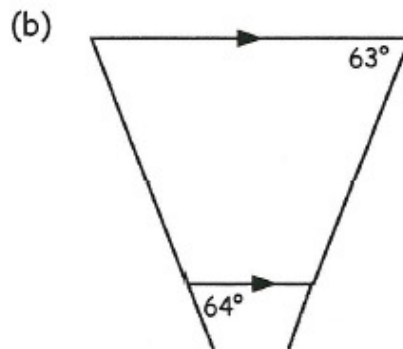
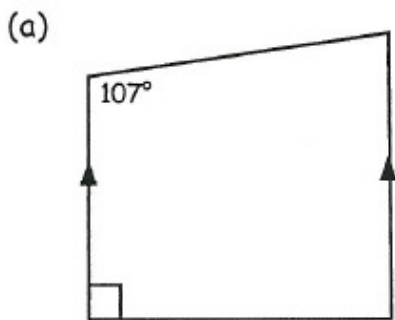
2. Make a largish sketch of parallelogram WXYZ and fill in the sizes of all of its angles.



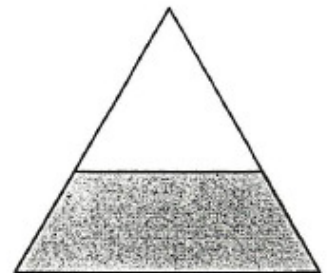
Two identical parallelograms are shown. Line MW is an axis of symmetry. Calculate the size of reflex angle SWT

### Exercise 11

1. Sketch each of the following trapezia and fill in all the sizes of the missing angles :-



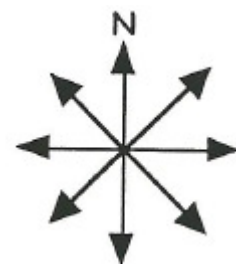
2. A trapezium is formed using an equilateral triangle. Sketch the figure and show the size of all the angles.



**MNU 3-17b: Having investigated navigation in the world, I can apply my understanding of bearings and scale to interpret maps and plans and create accurate plans, and scale drawings of routes and journeys**

### Exercise 1

1. How many degrees are there from :-
- (a) North to West (clockwise)      (b) South to North (anti-clockwise)
- (c) South West to North (clockwise)      (d) East to North East (clockwise) ?
2. (a) Bill was facing South East. He made a  $\frac{1}{4}$  turn anti-clockwise. In which direction is he now facing ?
- (b) Jane was walking North West and turned  $180^\circ$ . In which direction is Jane now walking ?



- (c) An aeroplane is flying North East.  
The plane turns  $135^\circ$  anti-clockwise.  
In which direction is the plane now flying ?



3. Joy is travelling North East on Crow Road.

- (a) In what direction will Joy be travelling if she left the roundabout :-

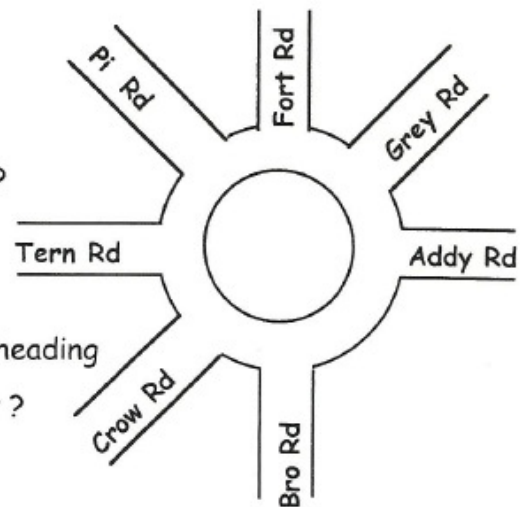
- (i) on Addy Road (ii) on Tern Road (iii) on Bro Road ?

May is on Fort Road travelling towards the roundabout.

- (b) In what direction is May travelling ?

- (c) Which road must May be on if she leaves the roundabout heading

- (i) North East (ii) South West (iii) North West ?



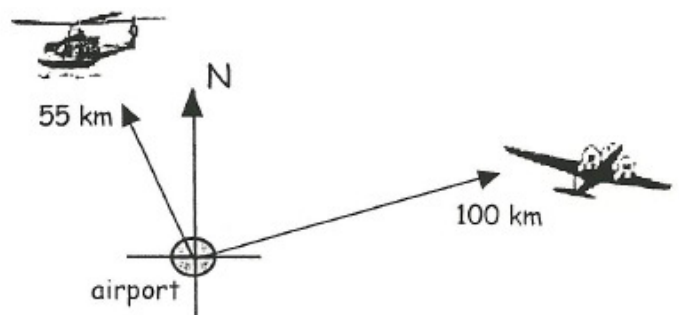
## Exercise 2

1. An aeroplane leaves an airport and flies 100 km on a bearing of  $080^\circ$

A helicopter leaves the airport at the same time on a bearing of  $330^\circ$  and flies for 55 km.

- (a) Make a scale drawing of the two journeys using a scale of  $1\text{ cm} = 10\text{ km}$ .

- (b) Calculate the distance between the two aircraft in kilometres.



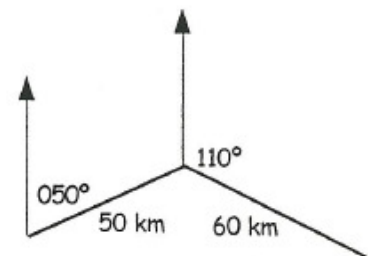
2. A boat leaves port and travels 50 km on a bearing of  $050^\circ$ .  
At this point the boat changes course to a bearing of  $110^\circ$  and sails for 60 km.

The boat then develops engine trouble and the captain decides to sail directly back to port.

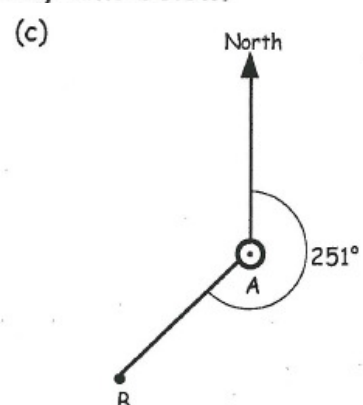
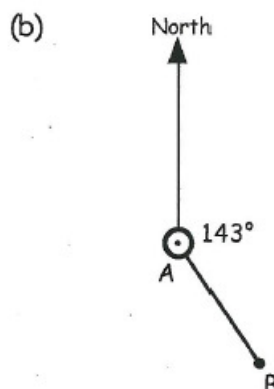
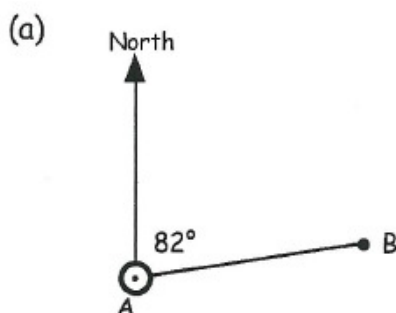
He estimates the boat could sail for 75 km before the engine fails completely.

Will the boat make it back to port before engine failure ?

(Hint : make a scale drawing of the journey).

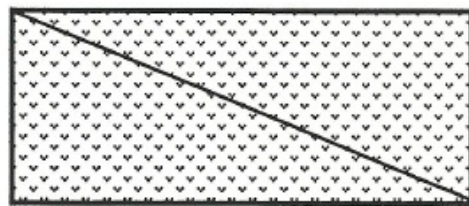


3. Calculate (do not measure) the bearing of A from B in the diagrams below.



### Exercise 3

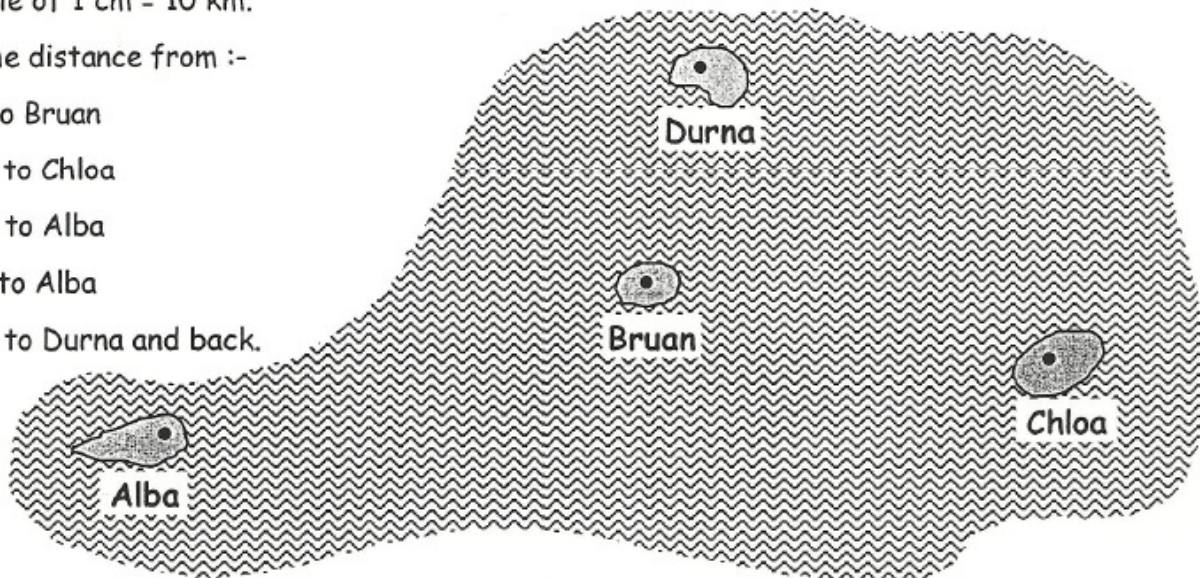
- A field has been drawn using a scale of  $1\text{ cm} = 7\text{ m}$ .
  - Calculate the real length of the field.
  - Calculate the real width of the field.
  - Calculate the real length of the diagonal path.



- The map shows a group of islands drawn using a scale of  $1\text{ cm} = 10\text{ km}$ .

Calculate the distance from :-

- Alba to Bruan
- Bruan to Chloa
- Durna to Alba
- Chloa to Alba
- Bruan to Durna and back.

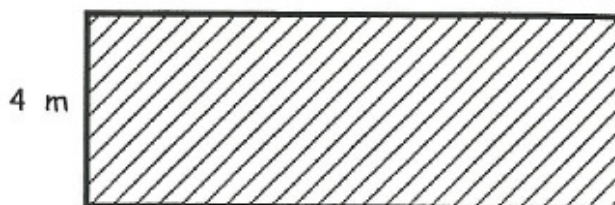


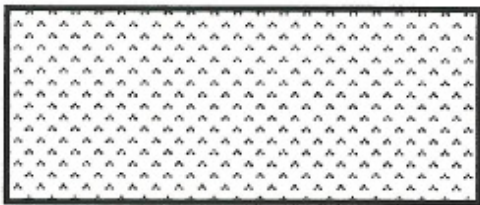
**MNU 3-17c: I can apply my understanding of scale when enlarging or reducing pictures and shapes, using different methods, including technology**

### Exercise 1

- This is a sketch of a rectangular room.

Make an accurate drawing using a scale of  $1\text{ cm} = 2\text{ m}$ .



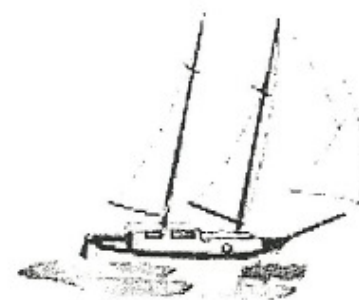
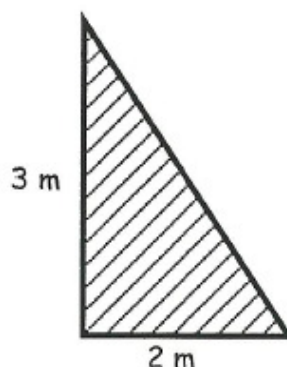
- 

Shown is a large rectangular field.

Make a scale drawing using a scale of  $1\text{ cm} = 20\text{ m}$ .

- The sail of a model yacht is as shown. It is in the shape of a right angled triangle.

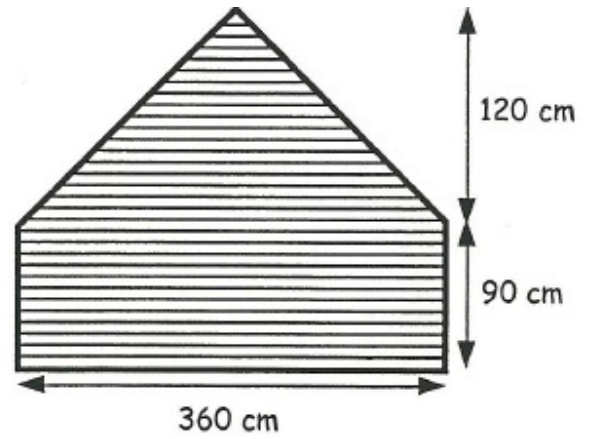
Make a neat scale drawing of the sail using a scale of  $1\text{ cm} = 25\text{ cm}$ .



4. This sketch shows the side view of a children's garden house.

It consists of an isosceles triangle on top of a rectangle.

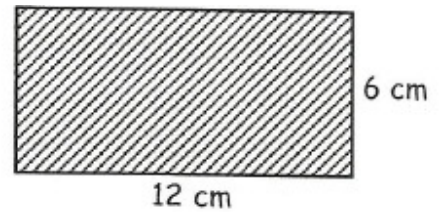
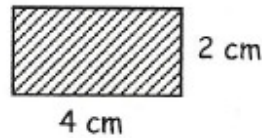
Make a scale drawing of it using a scale of  $1 \text{ cm} = 30 \text{ cm}$



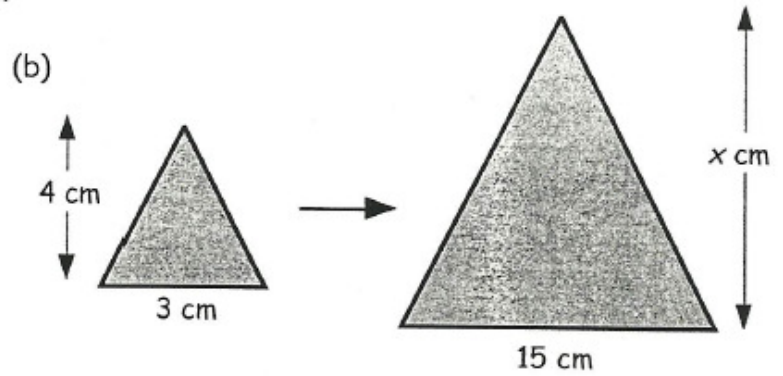
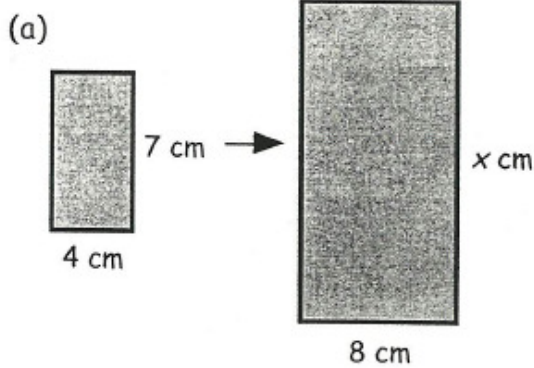
### Exercise 2

1. These rectangles are similar.

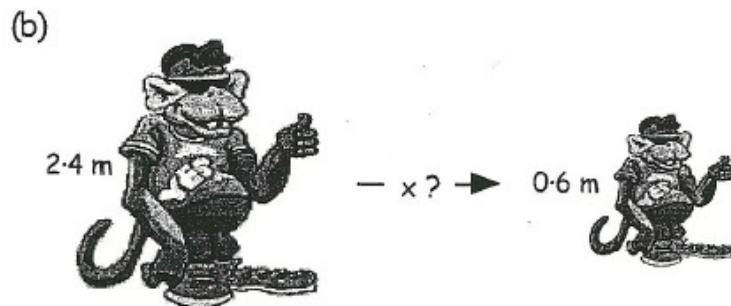
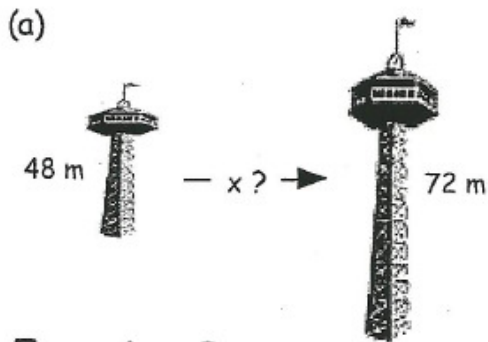
Compare their sides and write down the scale factor.



2. In each of the following pairs of similar figures, calculate  
(i) the scale factor (ii) the value of  $x$ .

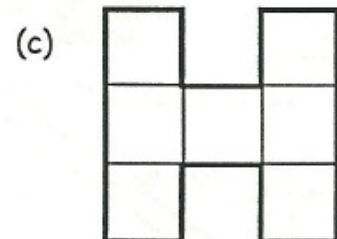
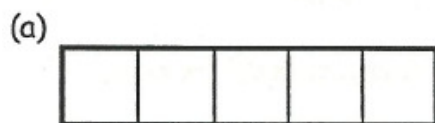


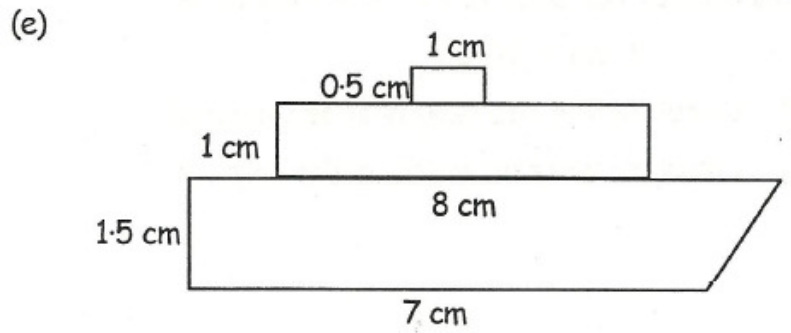
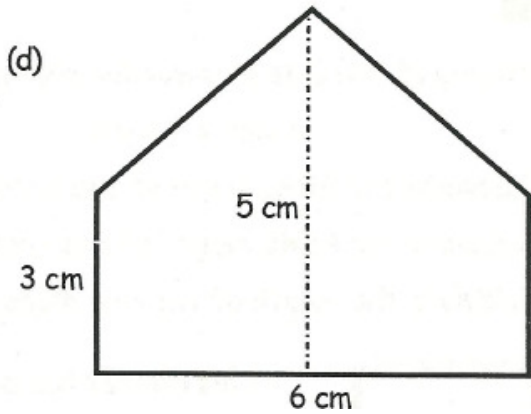
3. Find the enlargement factor for the tower and the reduction factor for the chimp.



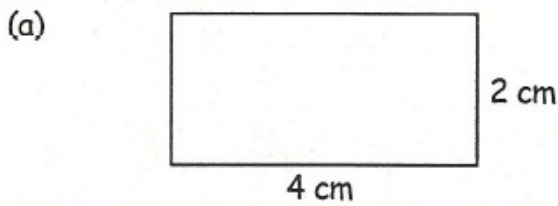
### Exercise 3

1. Make a neat "two-times" enlargement of each of these shapes :- (each box = 1 cm)

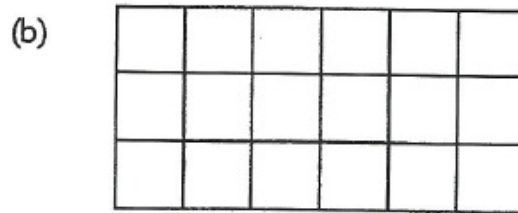




2. Make copies of the following shapes using the given scale factors:-



make a three times enlargement.



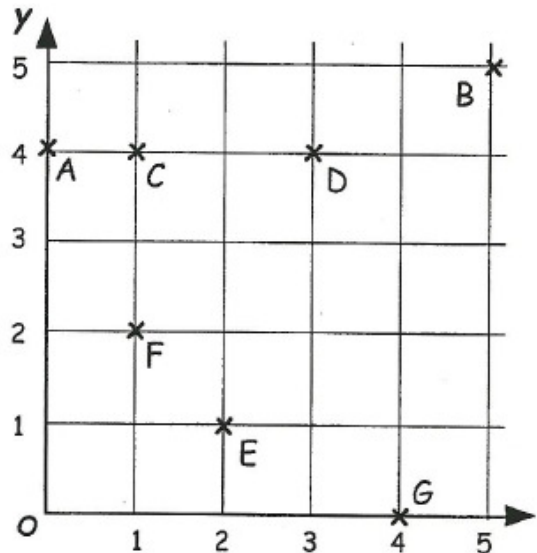
each box is 1 cm

make this a third of its size

**MNU 3-18a: I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid**

### Exercise 1

1. Look at the coordinate grid.



(a) Which point has an  $x$ -coordinate of 2 ?

(b) Which point has a  $y$ -coordinate of 5 ?

(c) What is the  $x$ -coordinate of D ?

(d) What is the  $y$ -coordinate of F ?

(e) Which point has its  $x$ -coordinate the same as its  $y$ -coordinate ?

(f) Which point lies on the  $x$ -axis ?

(g) Which point lies on the  $y$ -axis ?

2. (a) Draw a new grid (from 0 to 10 in each axis).

(b) Mark with a dot the following points and join them up in order.

$G(2, 1)$   $H(4, 1)$   $I(4, 4)$   $J(6, 4)$   $K(6, 5)$   $L(4, 5)$   $M(4, 7)$   $P(8, 7)$   $Q(8, 9)$   $R(2, 9)$   $G(2, 1)$ .

3. Draw a 10 by 10 coordinate grid.

(a) Mark with a dot the following points and join them up in order.

$A(5, 1)$   $B(2, 2)$   $C(2, 4)$   $D(3, 6)$   $E(5, 7)$   $F(7, 6)$   $G(8, 4)$   $H(7, 2)$  back to A.

(b) When the points are joined, what is the name of the shape you have formed ?

## Exercise 2E

1. The coordinates of A are  $(-3, 4)$ .

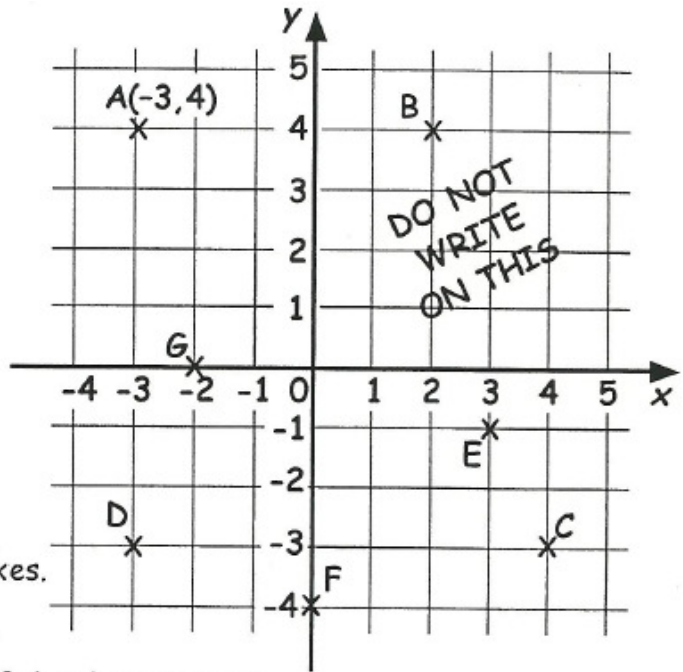
Write the coordinates of the other points.

(a) Copy the set of axes from question 1.

(b) Plot the following five points :-

J(2, 3), K(-1, 5), L(-4, 3),  
M(-4, -1) and N(2, -1).

(c) Name the shape formed when the five points are joined up in order.



2. (a) Draw a set of axes from -5 to 5 on both axes.

(b) Plot the points S(3, 2), T(5, 2) and U(6, 5).

(c) Join the three points and write the name of the shape formed.

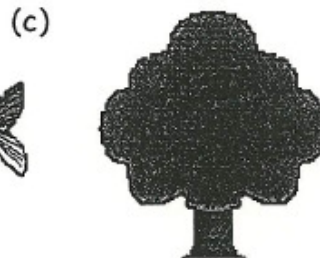
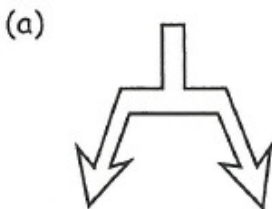
(d) Reflect this shape over the x-axis.

(e) Write the coordinates of the vertices of the new shape found.

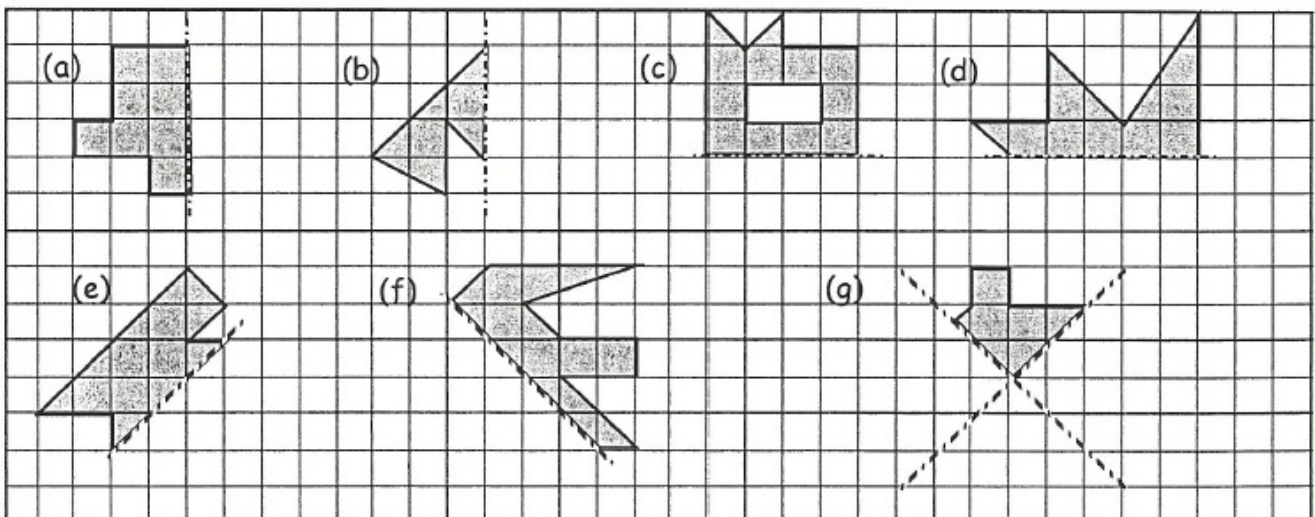
**MNU 3-19a: I can illustrate the lines of symmetry for a range of 2D shapes and apply my understanding to create and complete symmetrical pictures and patterns**

## Exercise 1

1. Write down how many lines of symmetry each of these shapes has.



2. Copy and complete each diagram so that each dotted line is a line of symmetry:-



**MNU 3-21b: I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology**

**Exercise 1**

1. The time taken for each music track at the disco was as follows (in minutes) :-

11 8 12 13 7 11 12 13 12 10 10  
9 10 10 11 9 10 11 8 8 9 8

Organise the data into a frequency table.



2. The vowels in the first paragraph of a book were counted to see which was most frequent.

Make a **frequency table** and **bar graph** to display the data.

A E A E I O U A E E E E E E  
U I A E A E I O U A E E E E  
E E U I A E A E I O U A E E  
E E E E E U I A A O E O E

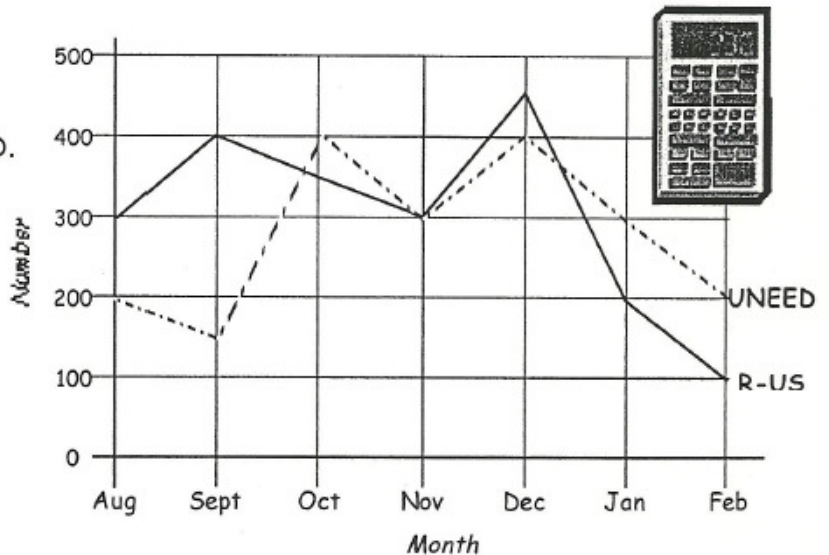
**Exercise 2**

1. The comparative line graph shows the sales of calculators from two different companies *CALC-R-US* and *CALCU-NEED*.

(a) How many calculators did *CALCU-NEED* sell in :-

- (i) August
- (ii) September
- (iii) January ?

(b) One company had a big advertising campaign between September and October. Which company ?



2. The monthly computer sales of three separate companies are as shown. :

Draw a comparative line graph showing the sales information of the three companies and make a comment about how the sales vary month by month.

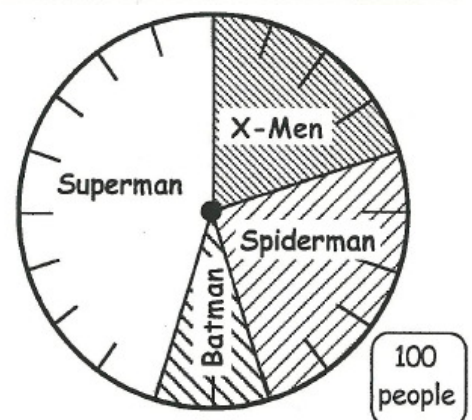
	Jan	Feb	Mar	Apr	May	Jun
JDK	100	200	300	200	300	400
IPS	300	250	150	200	400	450
HB	350	500	400	250	300	325

**Exercise 3**

1. 100 people were asked their favourite comic book.

How many people chose :-

- (i) Superman
- (ii) X-Men
- (iii) Spiderman
- (iv) Batman ?



2. This pie chart shows this year's senior school disco attendance.

(a) What percentage of the pupils were :-

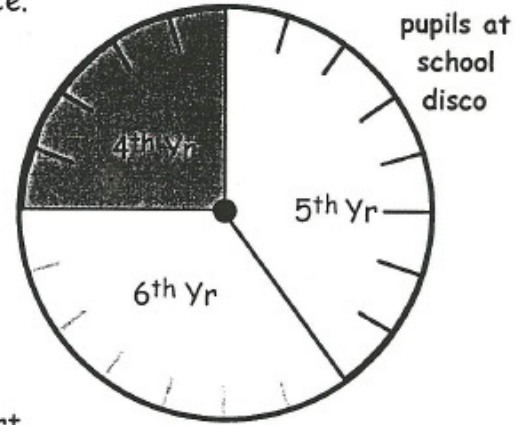
(i) 4th year (ii) 5th year (iii) 6th year ?

(b) If 480 pupils attended the disco, write how many from each year group there were.

(c) Last year, of the 480 in attendance half were 6th year, an fifth were 4th year and the rest were 5th year.

Copy or trace the outline of this pie chart.

Show last years disco attendance figures on your pie chart.



### Exercise 4E

1. Find the MEAN and the RANGE of the following :-

(a) 2, 3, 6, 5, 2, 9, and 8

(b) 41, 37, 53, and 45

(c) 13, 12, 12, 18, 14 and 15

(d) 3.1, 2.5, 3.6, 3.4 and 3.9.

2. Josh is a computer games whiz kid.

He completed each level of DEATHGAME in the following times (in minutes) :-

8.6, 9.5, 8.8, 7.9, 10.1, 8.9, 8.1, 8.3 and 9.

3. What was his mean time per level ?

The mean weight of 3 boys is 37 kg. Andy weighs 36 kg, Bill weighs 34 kg.

Calculate the weight of Colin.



**MNU 3-22a: I can find the probability of a simple event happening and explain why the consequences of the event, as well as its probability, should be considered when making choices**

### Exercise 1

1. In a race, 6 of the horses are male and the other 12 are female.

If a horse's name is chosen at random, what is the probability

(a) it will be male ? (b) it will be female ?

2. This 7-sided spinner is spun and the number noted.

Calculate, as a fraction, the probability it will point to :-

(a) the number 11,  $P(11)$  (b) an EVEN number,  $P(\text{even})$

(c) a MULTIPLE of 3 (d) the number 7 ?



3. The probability it will rain this week-end is  $\frac{3}{10}$ .

What is the probability it will not rain this week-end.