Easy Going
MATHEMATICS

Work Book

11+

BOOK 4

Ages 10-11

M.Nat
Practice Makes Perfect
Success at your fingertips

LUXMI EDUCATION

Acknowledgements

First and foremost I would like to thank god who has given me the guidance and knowledge to make this series of book. My heartfelt thanks goes to my   family for their tremendous support and encouragement throughout the making of this book.

I express my gratitude towards Nijea and Sharugi who has provided their valuable time to proof read and design this book . Last but not least I express my gratitude towards my students for their inspiration and progressive feedback which has only led me to improve this book.

M.Nat

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Third edition   2018

EASY GOING

MATHEMATICS

11+ (CEM)

BOOK 4

This book belongs to:

_____

M. NAT BSc, BEd, PGCE

Contents

Chapter 4   Venn Diagrams

Chapter 5   Probability

Chapter 6   Symmetry

Chapter 7   Co-ordinates

Chapter 8   Revision
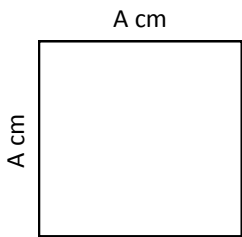
Key Terms

Perimeter: is the distance all the way around the outside of a shape. It is calculated by adding all the sides around the shape.

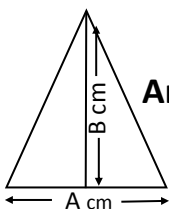**Area:** is a measure of the surface contained within the shape.

Square

A cm

A cm

Area = length x width

Perimeter = A cm + A cm + A cm +A cm (add all sides of the shape)

Rectangle

A cm

B cm

Area = length x width

Triangle

B cm

A cm

Area = $\dfrac{\text{base x height}}{2}$

Trapezium

A cm

H cm

B cm

Area = $\left[\dfrac{a + b}{2}\right]$ x h

Parallelogram

H cm

A cm

B cm
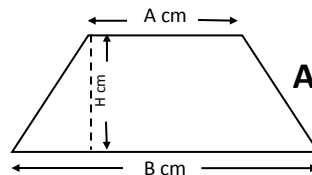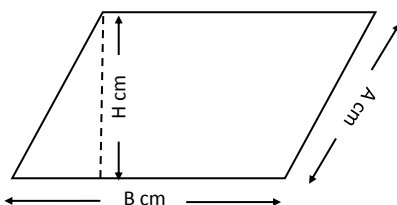
Area = base x height

Example:

2 cm

3 cm
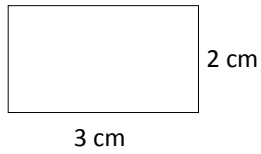
2 cm x 3 cm

Area = 6 cm^2

Find the area of each rectangle with these sides. Remember to add units at the end.

1) 11cm   by   8cm =   _____

2) 12cm   by   9cm =   _____

3) 10cm   by   8cm =   _____

4) 10mm   by   11mm =   _____

5) 2mm   by   8mm =   _____

6) 6mm   by   7mm =   _____

7) 8mm   by   9mm =   _____

8) 3mm   by   4mm =   _____

9) 4m   by   5m   =   _____

10) 7m   by   5m   =   _____

11) 12mm by   9mm =   _____

12) 7mm   by   8mm =   _____

13) 2.4cm by   10cm =   _____

14) 12mm by   10mm =   _____

15) 13mm by   11mm =   _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Find the area of each rectangle with these sides. Remember to add the units at the end.

1) 1.2cm   by   5cm =   _____   2) 7.9m   by   100m =   _____

3) 8.5mm by   2mm =   _____   4) 1.2mm by   2.4mm =   _____

5) 1.8mm by   3mm =   _____   6) 7.5mm by   2mm =   _____

7) 10mm   by   2.6mm=   _____   8) 14mm   by   2mm =   _____

9) 15mm   by   1.2mm =   _____   10) 25mm by   2mm =   _____

11) 30cm   by   4.0m =   _____   12) 3m   by   2.0m =   _____

13) 9.6mm by   10mm =   _____   14) 7.2mm by   1.2mm =   _____

15) 9.5mm by   10mm =   _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Example : To calculate the area of a rectangle with different units, first convert to
make both the units the same, then multiply the length by height.

6.8mm   by   2cm ──────────→ 0.68cm (6.8 ÷ 10)   by   2cm = $1.36cm^2$

Remember to add the unit at the end

Find the area of each rectangle. Give your answers in **cm^2**.

1) 11cm   by   8m   =   _____

2) 12cm   by   9mm =   _____

3) 10mm   by   8cm   =   _____

4) 10m   by   711mm =   _____

5) 12mm   by   8cm   =   _____

6) 6cm   by   27mm =   _____

7) 58mm   by   9cm   =   _____

8) 3m   by   54cm =   _____

9) 4m   by   95cm =   _____

10) 7m   by   105cm =   _____

11) 12m   by   9mm =   _____

12) 7cm   by   28mm =   _____

13) 2.4cm   by   30mm =   _____

14) 4.5cm   by   3cm   =   _____

15) 12mm   by   10mm =   _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Area with conversion of units 2

Find the area of each rectangle. Give your answers in **cm²**.

1) 11.2mm by   5cm =   _____

2) 7.9m   by   100cm = _____

3) 8.5mm   by   2cm =   _____

4) 1.2cm   by   2.4mm =   _____

5) 1.8m   by   3m   =   _____

6) 7.5m   by   72cm =   _____

7) 10mm   by   2.6cm =   _____

8) 14cm   by   12mm =   _____

9) 15cm   by   21.2mm = _____

10) 25cm   by   62mm =   _____

11) 30mm by   4cm =   _____

12) 703.0cm by 2.0m   =   _____

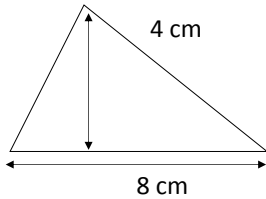13) 9.6cm by   10mm =   _____

14) 7.2cm by   31.2mm = _____

15) 9.5mm by   10mm =   _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Area & Perimeter

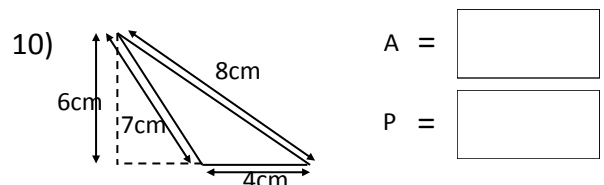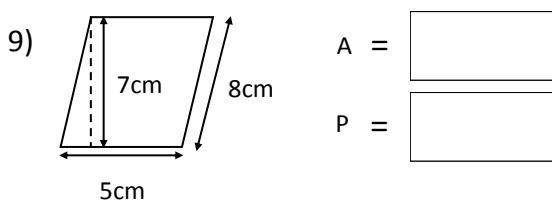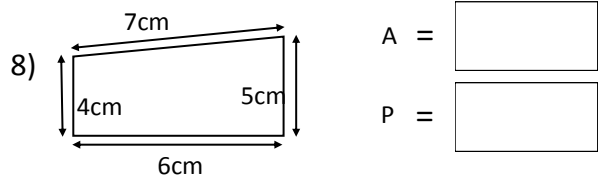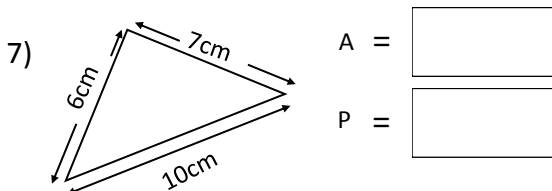**Example :** To calculate the area of a triangle use the formula, where b is the base, h is the height.

$$\text{Area} = \frac{(b \times h)}{2}$$

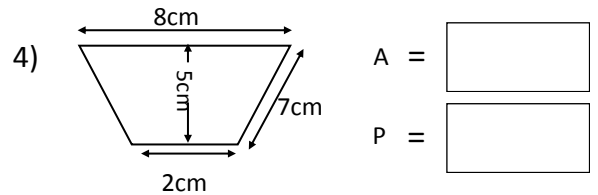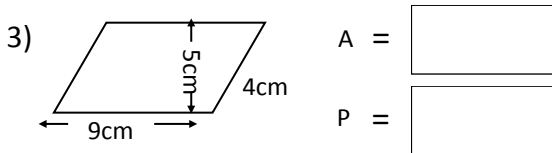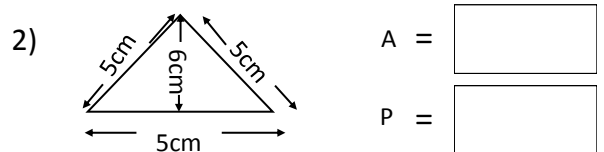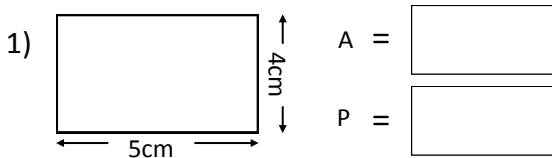$$\text{Area} = \frac{(8 \times 4)}{2} = \frac{32}{2} = 16 \text{ cm}^2$$

4 cm

8 cm

Remember to add the unit at the end.
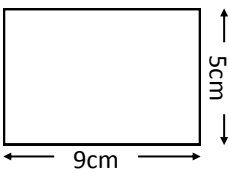
Find the area (A) and the perimeter (P) of the following shapes.
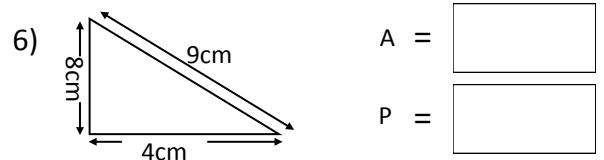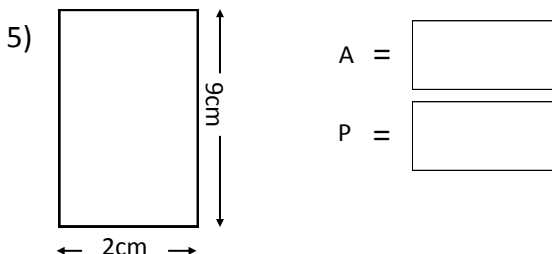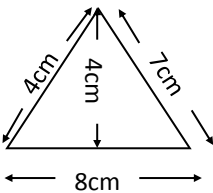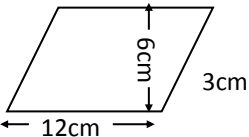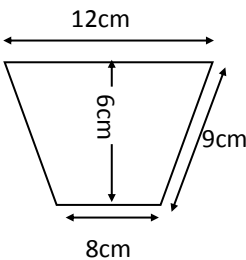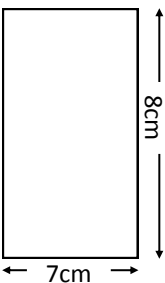
1) 4cm   5cm

A =

P =

2) 5cm 6cm 5cm   5cm

A =

P =

3) 5cm 4cm 9cm

A =

P =

4) 8cm 5cm 7cm 2cm

A =

P =

5) 9cm 2cm

A =

P =

6) 8cm 9cm 4cm

A =

P =

7) 7cm 6cm 10cm

A =

P =

8) 7cm 4cm 5cm 6cm

A =

P =

9) 7cm 8cm 5cm

A =

P =

10) 6cm 8cm 7cm 4cm

A =

P =

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Area & Perimeter 2

1)

5cm

5cm

9cm

A =

P =

2)

6cm

3cm

12cm

A =

P =

3)

8cm

7cm

A =

P =

4)

4cm

7cm

8cm

A =

P =

5)

8cm

9cm

4cm

A =

P =

6)

4cm

4cm

7cm

8cm

A =

P =

7)

12cm

6cm

9cm

8cm

A =

P =

8)

9cm

7cm

4cm

A =

P =

9)

6cm

5cm

6cm

7cm

A =

P =

10)

5cm

6cm

8cm

3cm

A =

P =
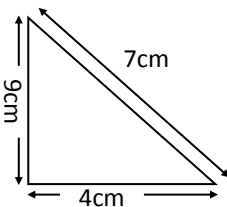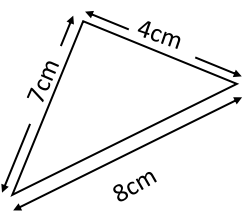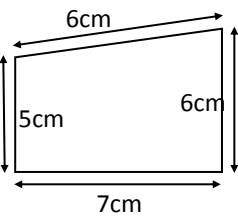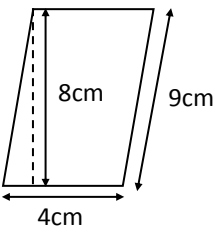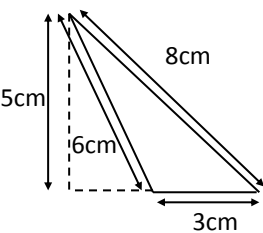
Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Area of compound shapes

Example : To calculate the area of a compound shapes:

1 cm

A

4 cm

B

1 cm

5 cm
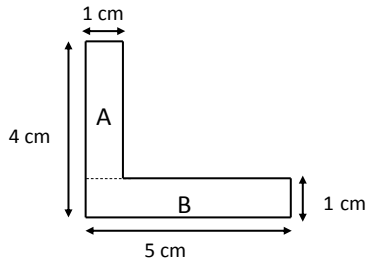
Remember to add the unit at the end.

1) Make shape that you can find areas for, in this example we have 2 rectangle, which is shown by the dotted line.

2) Find the area of each shape:

Area of A = 3 x 1 = 3 cm^2
Area of B = 5 x 1 = 5 cm^2

3) Add the areas of each of the shape.

Area of compound shape =
3 + 5 = **8 cm^2**

Find the area (A) and the perimeter (P) of the shaded compound shapes.

1)

2cm

8cm

10cm

12cm

A =

P =

2)

1cm   1cm

12cm   11cm

12cm

A =

P =

3)

3cm

12cm

2cm

4cm

2cm

A =

P =

4)

8cm

4cm

2cm

9cm

A =

P =

5)

8cm

6cm

4cm   4cm   4cm

5cm

A =

P =

6)

11cm   3cm

13cm

4cm

3cm

5cm

A =

P =

11

7)

3 cm

11 cm

2 cm

5 cm

2 cm

A = [ ]

P = [ ]

8)

10 cm

5 cm

3 cm

12 cm

A = [ ]

P = [ ]

9)

1 cm

1 cm   3 cm

6 cm

6.1 cm

3 cm

5 cm

3 cm

1 cm

4 cm

1 cm

A = [ ]

P = [ ]

10)

5 cm

3 cm

3 cm

4cm

A = [ ]

P = [ ]

11)

1 cm

3 cm

4 cm

4 cm

4 cm

1 cm

1 cm

A = [ ]

P = [ ]

12)

4 cm

5 cm

4 cm

3 cm

2 cm

3 cm

8 cm

2 cm

A = [ ]

P = [ ]
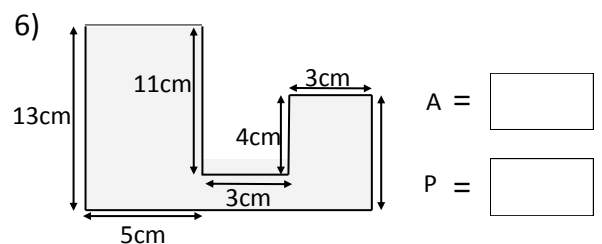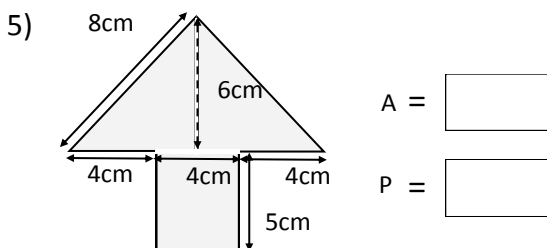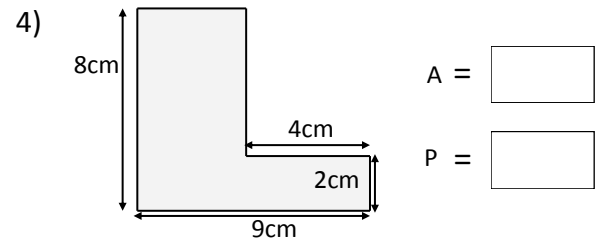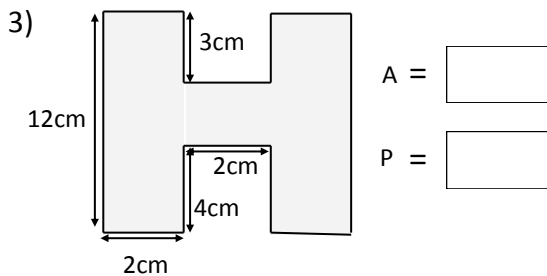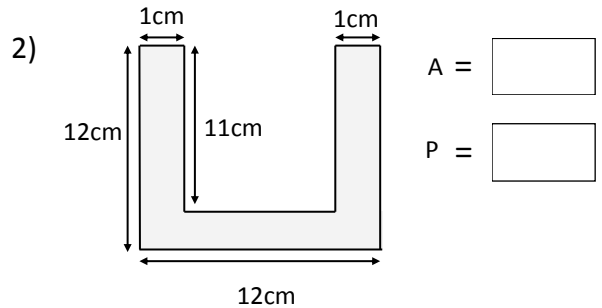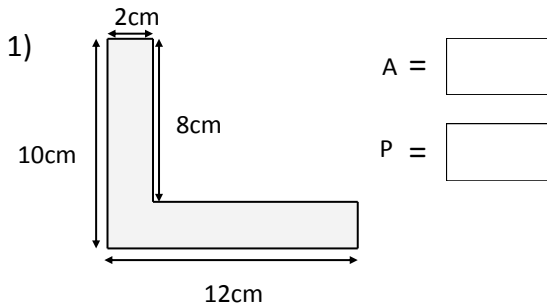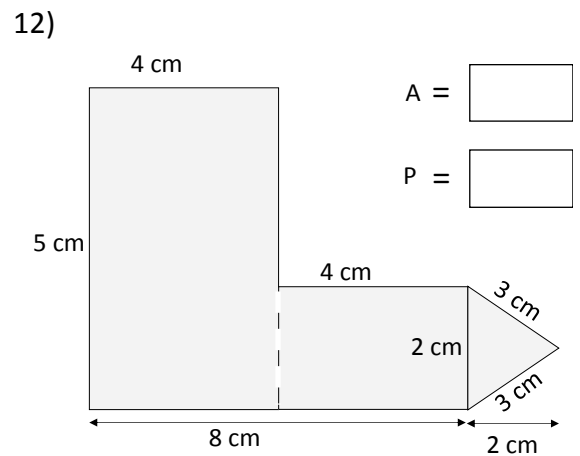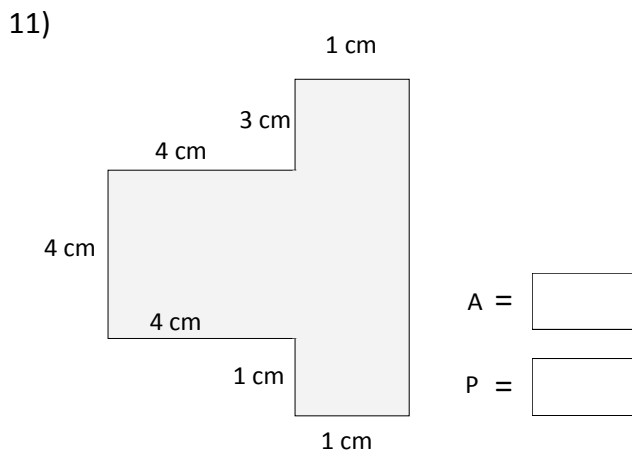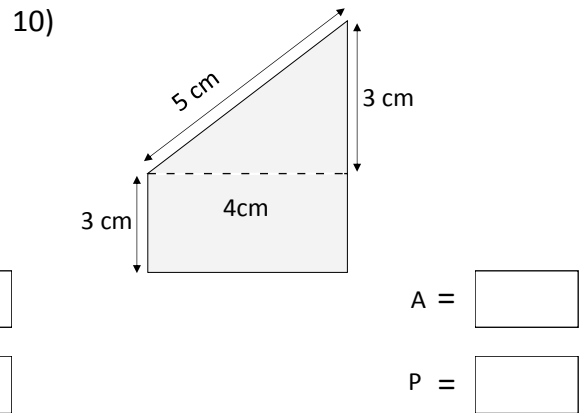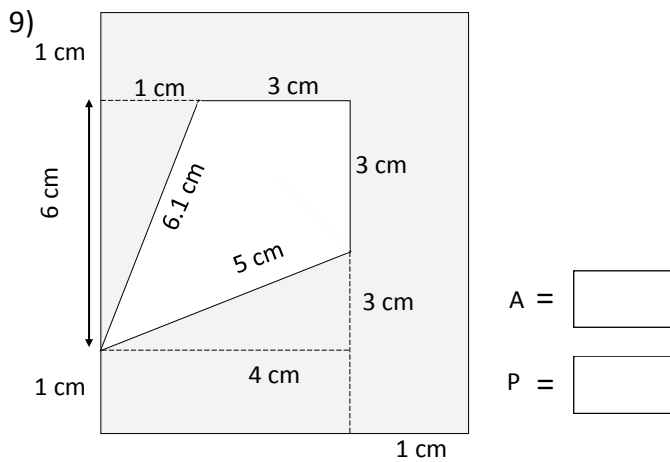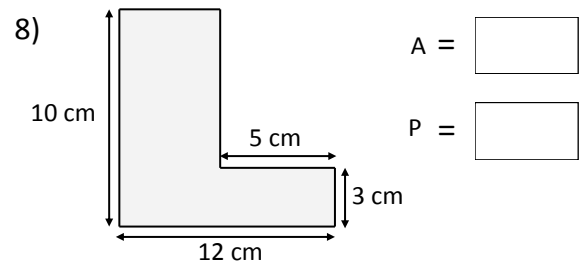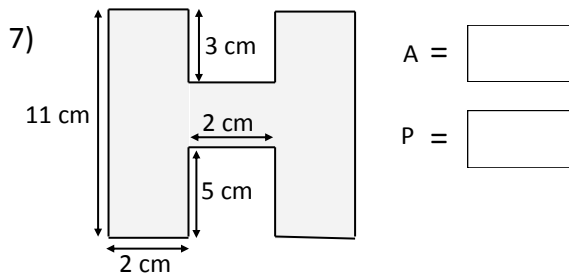
Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

12

Example : Find the missing length of the shape

42cm^2 a cm

6cm
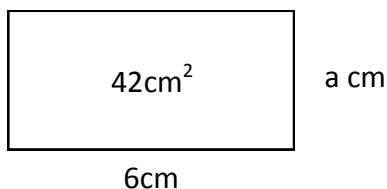
$42 \div 6 = 7$

$a = 7$

Find the length of the missing side (a).
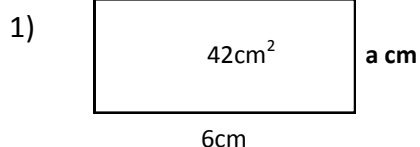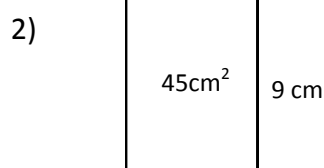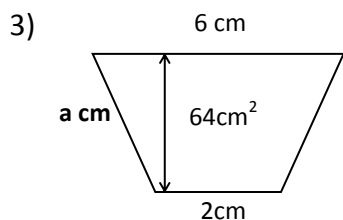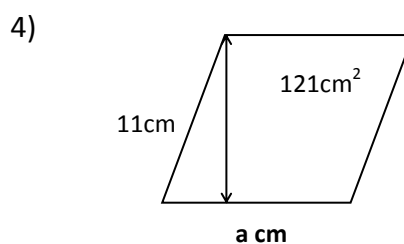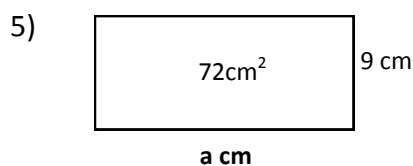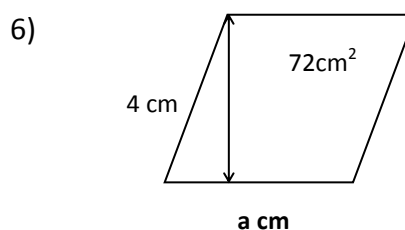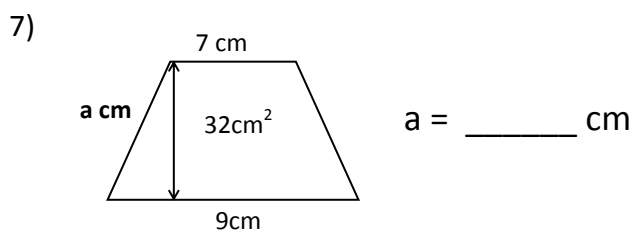
1)

42cm^2 **a cm**

6cm

a = _____ cm

2)

45cm^2 9 cm

a cm

a = _____ cm

3)

6 cm

a cm   64cm^2

2cm

a = _____ cm

4)

121cm^2

11cm

a cm

a = _____ cm

5)

72cm^2 9 cm

a cm

a = _____ cm

6)

72cm^2

4 cm

a cm

a = _____ cm

7)

7 cm

a cm   32cm^2

9cm

a = _____ cm

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

13

Example : What is the area of a field if the length is 5m and the width is 6m?

$\quad$ Area of field $\quad$ = 5 x 6

$\qquad\qquad\qquad$ = **30m^2**

Answer the questions by reading the information carefully.

1) A stamp is 20mm by 30mm.

a) Calculate the area of the stamp in mm^2 ? $\quad$ _____

b) How many mm^2 are there in 1cm^2 ? $\quad$ _____

c) Find the area of the stamp in cm^2 $\quad$ _____

2) A square sheet of gift stamps measures 9cm by 9cm. If each stamp measures 3cm by 3cm, how many does the sheet contain?

_____

3) A square lawn measures 5m by 5m, and it is to be covered with pieces of turf which measures 50cm by 50cm. How many pieces of turf are required?

_____

4) A square yard measures 8m by 8m, and it is to be covered with paving slabs which measure 2m by 80cm. How many slabs are required?

_____

5) A wall space in a bathroom measures 1m by 2m, and it is to be covered with square tiles which measure 10 cm by 10cm. How many tiles are required?

_____

6) A square yard measures 12m by 12m, and it is to be covered with paving slabs which measure 4m by 80cm. How many slabs are required?

_____

7) A wall space in a bathroom measures 3m by 2m, and it is to be covered with square tiles which measure 10 cm by 10cm. How many tiles are required?

_____

8) Meena has made some toffee in a tray which measures 30cm by 15cm. She cuts the toffee into square pieces which measures 3cm by 3cm. How many pieces will there be?

_____

9) Mr Peter wants to build a driveway in front of his house. The driveway measures 28 cm by 30 cm. He has to use 40 stabs for this. What must be the measurement of one of the slab?

_____

10) A model of a house, needs its carpet changed for its living room. The living room dimension is 48 cm by 12 cm. How much carpet does it require?

_____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Volume: It is the measure of the amount of space inside of a solid figure, like cube.
It's unit is always 'cubic' like cm^3.

Volume
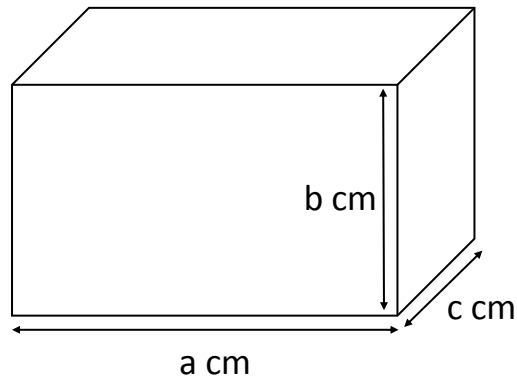
VOLUME = LENGTH × WIDTH × HEIGHT

VOLUME = a cm × b cm × c cm = abc cm^3

Find volume using a shape's area

5 cm^2

6 cm
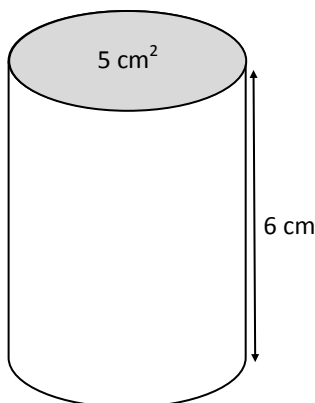
If the area of the shaded circle is 5cm^2 and the height of the cylinder is 6cm.

Volume = Area of shape x height

Volume = 5 x 6

= 30 cm^3

Calculate the Volume

Example : Find the volume of the following shape.
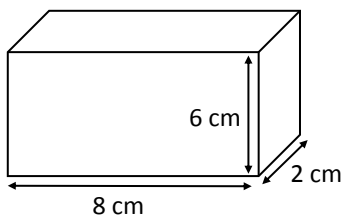
Volume = length x width x height

= 8 x 2 x 6

= **96 cm³**

6 cm

2 cm

8 cm

For each of the following cuboids, calculate the volume.

1)

4cm

2cm

6cm

V =

2)

5cm

7cm

2cm

V =

3)

1cm

8cm

0.5cm

V =

4)

9cm

2.5cm

2cm

V =

5)

7cm

2cm

4cm

V =

6)

3cm

0.5cm

10cm

V =

7)

1.5cm
3cm
11cm

V = [ ]

8)

4cm
0.5cm
12cm

V = [ ]

9)

8cm
6cm
2cm

V = [ ]

10)

2 cm^2
4 cm

V = [ ]

12)

10 cm^2
5 cm

V = [ ]

13)

10 cm
25 cm^2
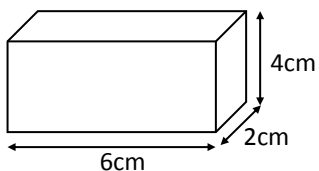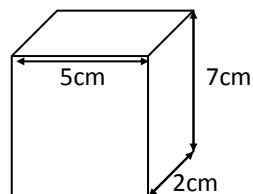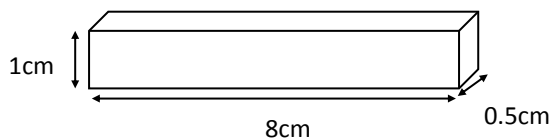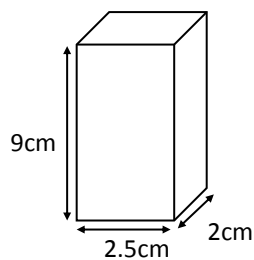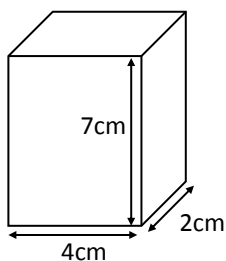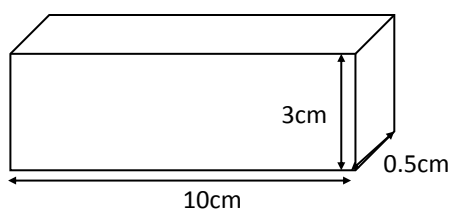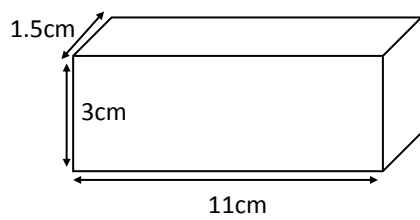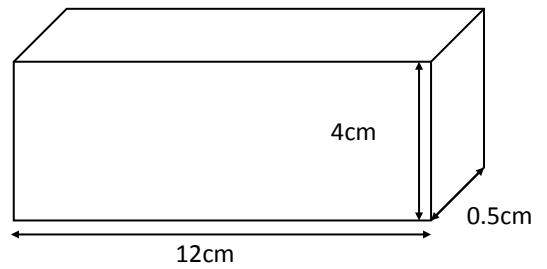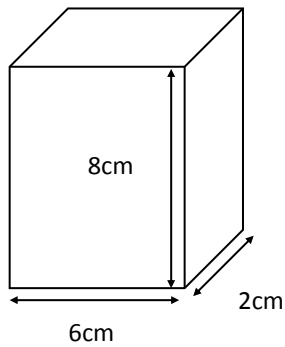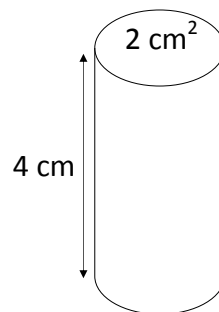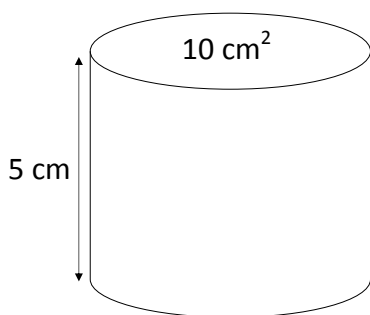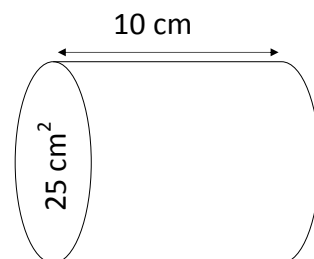
V = [ ]

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

18

Example : What is the value of the missing side?

Length	Width	Height	Volume
2cm	3cm	1 cm	6cm^3

Working out: 6 cm ÷ (2 cm x 3cm) = 1 cm.

Find the value of the missing measurement.

	Length	Width	Height	Volume
1)	6cm	3cm	cm	36cm^3
2)	9cm	4cm	cm	108cm^3
3)	5cm	cm	2cm	40cm^3
4)	10cm	cm	3cm	60cm^3
5)	cm	3cm	4cm	96cm^3
6)	6cm	cm	40mm	72cm^3
7)	cm	7cm	4cm	56cm^3
8)	mm	60mm	50mm	60cm^3
9)	7cm	cm	20mm	56cm^3
10)		80mm	90mm	144cm^3
11)	11cm	120mm	mm	132cm^3
12)	1m	0.5m	m	2m^3
13)	0.6m	3m	m	1.8m
14)	cm	200cm	400cm	72m^3
15)	600cm	cm	800cm	144m^3

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Example : A rectangle container is 20cm long and 25cm wide. If it holds 5 litres of water when full, what is the height of the container (*5 litre = 5000cm³*).

Volume   =   height x length x width
5000   =   h x 20 x 25
h   **=**   **10cm**

Answer the following questions by reading the questions carefully.(1 litre = 1000cm²)

1) The water tank in a house has a square base measuring 20cm by 20cm. If it is filled with water to a depth of 40cm , how many litres does it contain?

    _____

2) A rectangular coffee urn has a base which measures 10cm by 35cm and it is 30cm high. How many litres of coffee does it contain when full?

    _____

3) A paraffin can has a base measuring 20cm by 25cm, and it is filled to a depth of 50cm. How many times can the tank of a heater be filled from this quantity of paraffin if the tank measures 25cm by 10cm by 20cm?

    _____

4) A small oil can has dimensions 10cm by 7.5cm by 4cm.

    a) Find its volume in cm³   _____

    b) Find its capacity in millilitres   _____

    c) Find its capacity in litres   _____

5) A man is driving a car which suddenly runs out of petrol. In the boot of the car is a full can of petrol which measures 25cm by 15cm by 8cm. If the man is 50km from home and his car travels 17km on every litre of petrol, has he enough to get home?

    _____

6)   A metal block , measuring 30 cm by 10cm by 8cm is measured. How many litres of liquid metal are there?

_____

7)   Find the capacity, in litres, of a rectangular carton measuring 20cm by 15cm by 10cm.

_____

8)   A rectangular box is 30cm long , 20 cm wide and 5 cm deep. How many litres of water will it hold?

_____

9) Look at the cube diagram and answer the following questions.

Water

a) Find the capacity of the water tank.   _____

6 cm

b) If they filled one third of the tank, then how much water is needed to fill the tank?

6 cm

6 cm

_____

10)

7 cm

2 cm

2 cm

5 cm

2 cm

2 cm
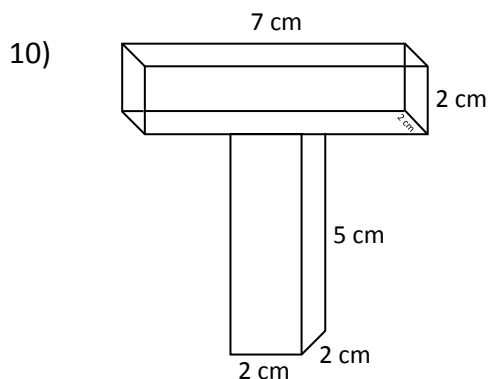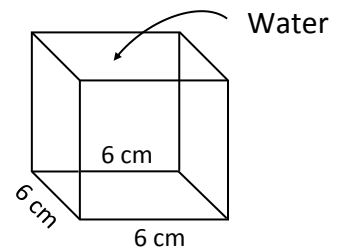
The letter T shape is made by sticking together 2 cuboids as shown in the diagram on the left. What is the total volume in cm^3 of the letter T.

_____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Length

1 kilometre (km)	=	1000 metres (m)
1 metre (m)	=	1000 millimetres (mm)
1 centimetre (cm)	=	10 millimetres (mm)
1 metre (m)	=	100 centimetres (cm)

Mass

1 tonne (t)	=	1000 kilograms (kg)
1 kilogram (kg)	=	1000 grams (g)

Capacity

1 litre (l)	=	1000 millilitres (ml)
1 litre (l)	=	100 centilitres (cl)
1 centilitre (cl)	=	10 millilitres (ml)
1 litre (l)	=	1000 cubic centimetres (cm^3)
1 millilitre (ml)	=	1 cubic centimetre (cm^3)
1000 litres (l)	=	1 cubic metre (m^3)

Time

1 hour (hr)	=	60 minutes (min)
1 year	=	365 days
1 decade	=	10 years
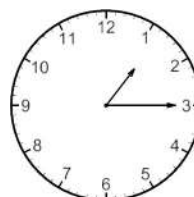
Converting Lengths

Example: Convert 8cm to mm.

8cm   to | **80** | mm

As 1cm is 10mm, you will have to multiply 8 by 10.

Convert the values for the following questions to the correct units.

1)   10cm   to | | mm

2)   42000cm   to | | m

3)   26cm   to | | mm

4)   75000cm   to | | m

5)   18cm   to | | mm

6)   90000cm   to | | m

7)   45cm   to | | mm

8)   7000cm   to | | m

9)   180mm   to | | cm

10)   5km   to | | m

11)   760mm   to | | cm

12)   223m   to | | cm

13)   70mm   to | | cm

14)   330m   to | | cm

15)   400mm   to | | cm

16)   600m   to | | cm

17)   6m   to | | cm

18)   40m   to | | cm

19)   42m   to | | cm

20)   4500cm   to | | m

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Example: Convert 275cm to m and cm.

275cm   to | **2** | m | **75** | cm

As 100cm is 1m, you will have to divide 275 by 100. The whole number will be metre and reminder will be centimetre.

Convert the values for the following questions to the correct units.

1)   235cm   to   [   ] m   [   ] cm

2)   645cm   to   [   ] m   [   ] cm

3)   305cm   to   [   ] m   [   ] cm

4)   1595m   to   [   ] km   [   ] m

5)   4320m   to   [   ] km   [   ] m

6)   7654kg   to   [   ] ton   [   ] kg

7)   9875kg   to   [   ] ton   [   ] kg

8)   4535kg   to   [   ] ton   [   ] kg

9)   6542ml   to   [   ] l   [   ] ml

10)   4500ml   to   [   ] l   [   ] ml

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Convert the values for the following questions to the correct units.

1)   3200cm   to   [   ] km   [   ] m

2)   74mm   to   [   ] cm   [   ] mm

3)   93mm   to   [   ] cm   [   ] mm

4)   780cm   to   [   ] m   [   ] cm

5)   1200cm   to   [   ] m   [   ] cm

6)   1245m   to   [   ] km   [   ] m

7)   2340cm   to   [   ] m   [   ] cm

8)   5345g   to   [   ] kg   [   ] g

9)   73mm   to   [   ] cm   [   ] mm

10)   2365g   to   [   ] kg   [   ] g

11)   7600g   to   [   ] kg   [   ] g

12)   3450ml   to   [   ] l   [   ] ml

13)   320min   to   [   ] hr   [   ] min

14)   400min   to   [   ] hr   [   ] min

15)   540min   to   [   ] hr   [   ] min

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Express the given quantity in terms of the units specified.

1) 4m | cm |

2) 12km | m |

3) 7m | cm |

4) 1km | cm |

5) 1kg | g |

6) 52mm | cm |

7) 5cm | mm |

8) 8km | m |

9) 14cm | mm |

10) 8586g | kg |

Read the question carefully and answer the following questions.

11) Find the total weight in grams, of 200g of sugar, 3kg of potatoes and 2kg of flour.

_____

12) Find the total length in millimetres, of piece of wood 85cm long and another piece of wood 350mm long.

_____

13) Tom travelled from his house to the shop, which is 54km away, then he went to his friends house, which is 12km. How much did he travel in total, including getting back to his house?

_____

Calculate the following sums, giving your answer in the required units.

14)   35cm + 70mm   =   [   ]   mm

15)   7cm + 4.5mm   =   [   ]   mm

16)   32cm + 12mm + 2m   =   [   ]   mm

17)   2cm + 4m + 2.8cm   =   [   ]   mm

18)   4kg + 200g   =   [   ]   g

19)   2kg + 0.6kg + 450g   =   [   ]   g

20)   9kg + 0.8kg + 750g   =   [   ]   g

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

SUB SET

MAIN SET
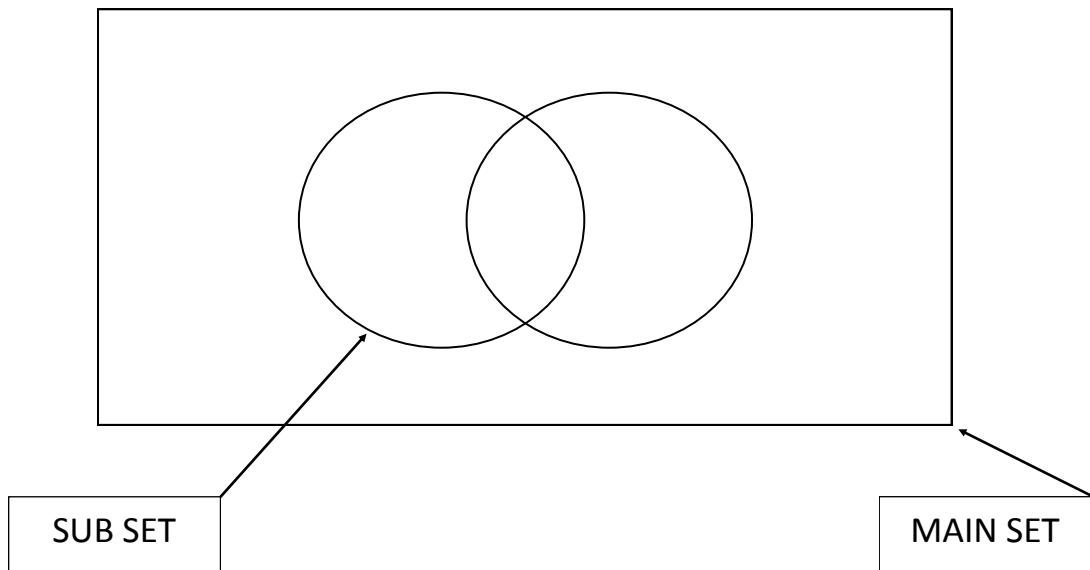
Example

A = { 2, 3, 5, 7 } ; B = {2, 4, 6, 8}

Illustrate this information on a Venn diagram.

3

4

5

2

6

8

7
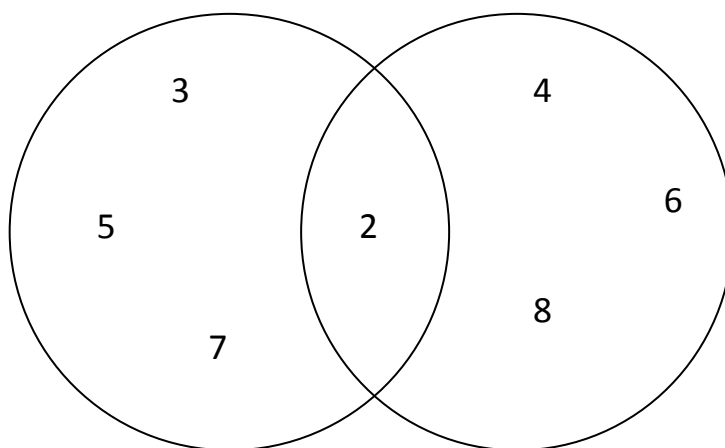
The middle area (which is in both sets) represents A ∩ B = { 2 }

The whole diagram represents A U B = {2, 3, 4, 5, 6, 7, 8}

Example: From the Venn diagram below list the elements in

a) set A   b) set B   c) A∩B   d) A U B

A   2   7   B

3   9

5

8
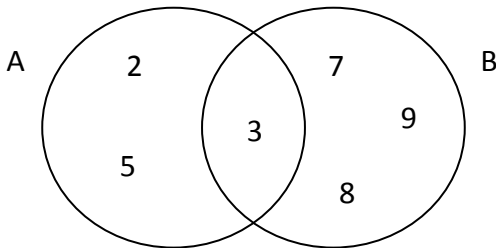
Answers:

a) 2 , 3 , 5   b) 7, 3, 9, 8

c) 3   d) 2, 3, 5, 7, 8, 9

Answer the following questions.

1)   From the Venn diagram below list the elements in:

X   1   6   Y

3   7   30   32

4

8

35   31

a) set X   _____

b) set Y   _____

c) X ∩ Y   _____
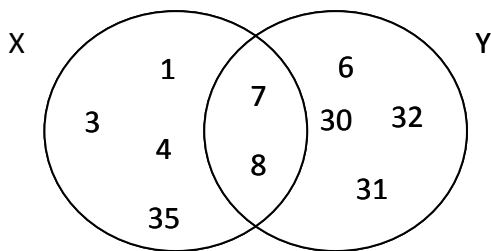
d) X U Y   _____

2) From the Venn diagram below list the elements in:

a) set P   _____

b) set Q   _____

c) P ∩ Q   _____

d) P U Q   _____

P   Q

45

15   55

42

40

35   25
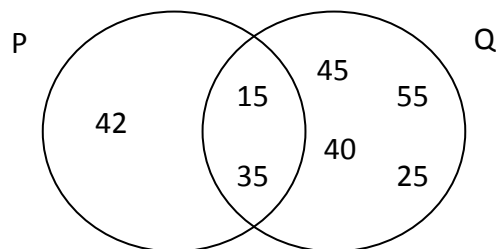
3)

From the Venn diagram below list the elements in:

a) set P _____

b) set Q _____

c) P ∩ Q _____
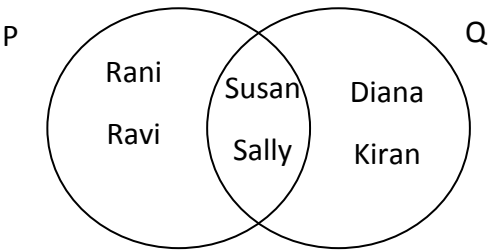
d) P U Q _____
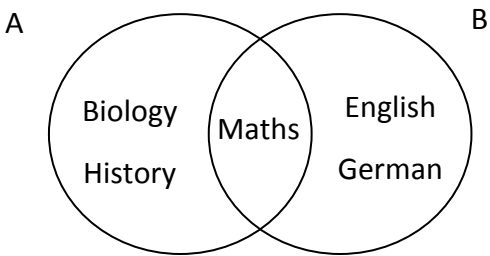
4) From the Venn diagram below list the elements in:

a) set A _____
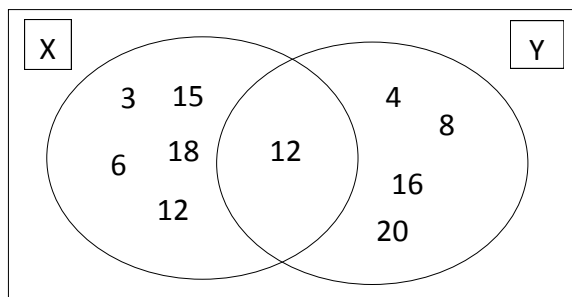
b) set B _____

c) A ∩ B _____

d) A U B _____
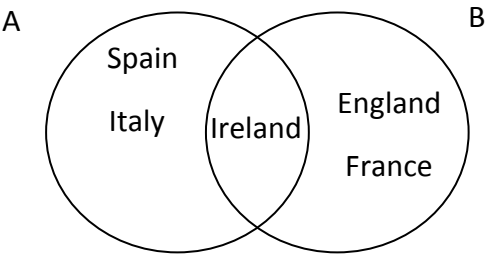
5)

From the Venn diagram below list the elements in:

a) set A _____

b) set B _____

c) A ∩ B _____

d) A U B _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Example: Draw a Venn diagram with the information given.

X = {3, 6, 9, 12, 15, 18}

Y = {4, 8, 12, 16, 20}

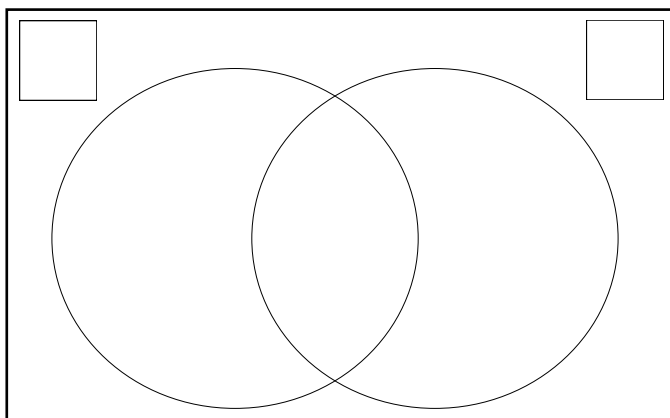For the following questions, draw a Venn diagram in the space given, using the information provided.

1)   A = {2, 3, 4, 5, 6, 8, 12}   B = {4, 5, 13, 16, 17, 18}
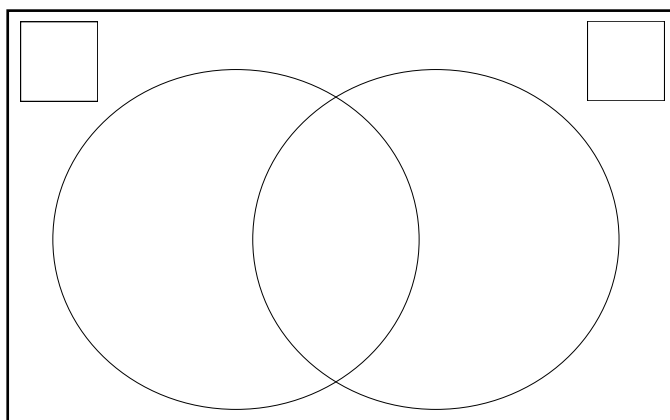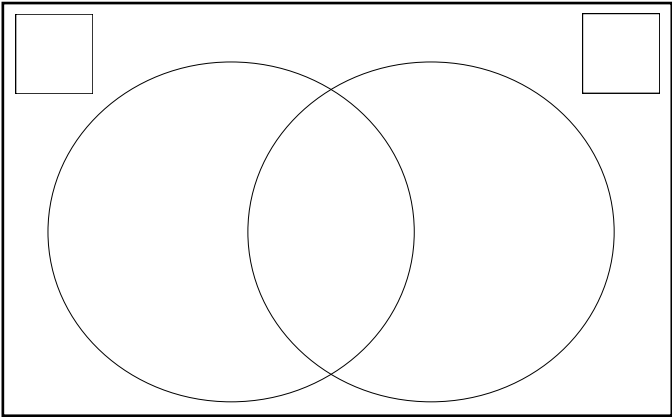

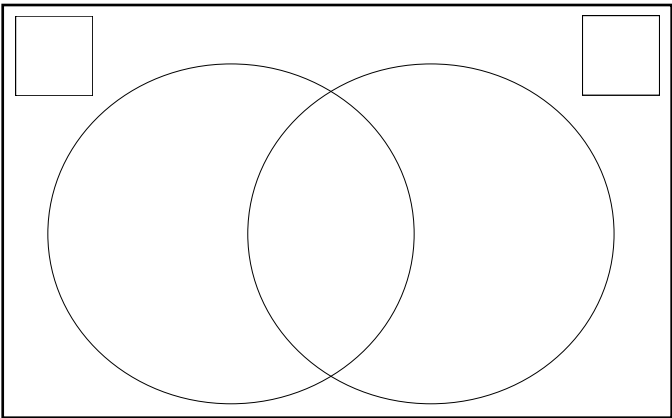2)   X = {D, R, O, W, N}   Y = {D, O, C, T, R, I, N}

3)   P = {1, 4, 9, 16}   Q = {4, 8, 12, 16, 20}
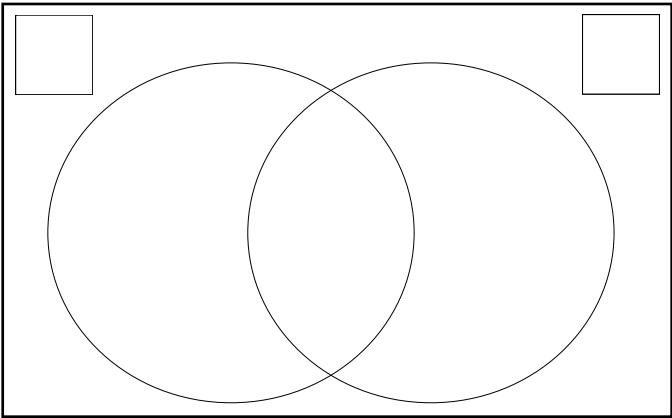

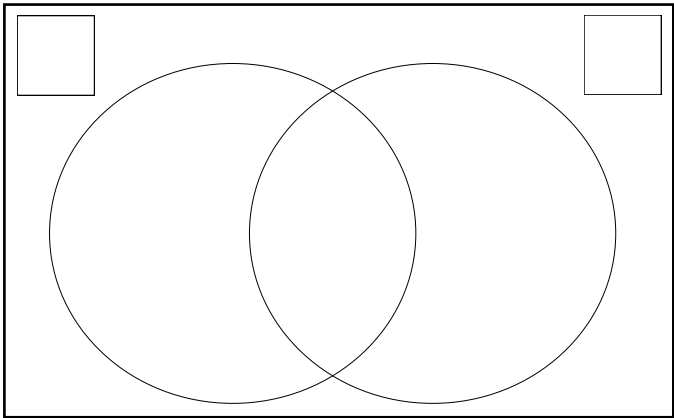4)   A = {6, 12, 18, 24, 30, 36, 42, 48}   B = {9, 18, 27, 36, 42, 48}
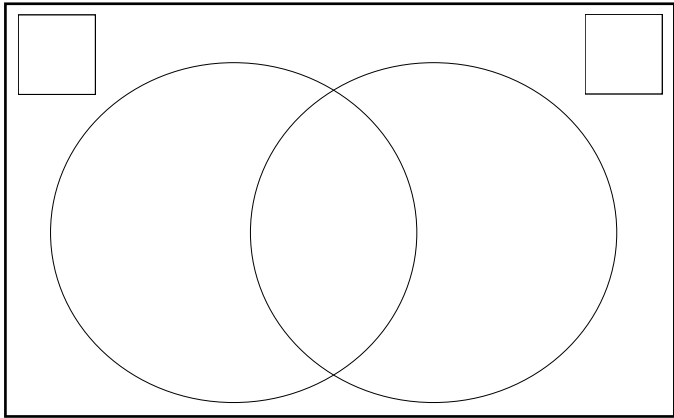

5)   M = {B, A, T, H}   N = {B, A, T}
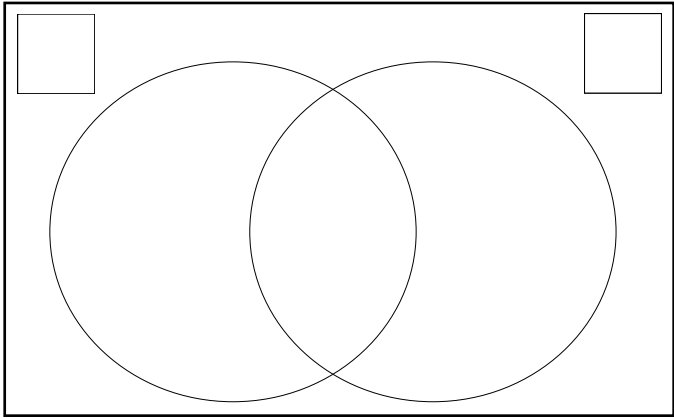
6)   X = {4, 8, 12, 16, 20, 24, 28}   Y = {8, 16,   24,   29,   30, 31}
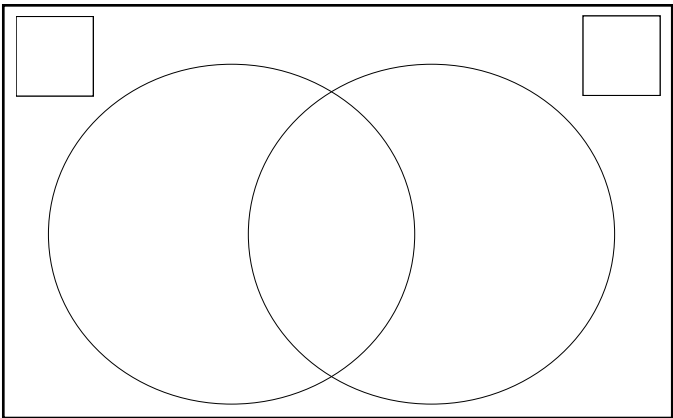
7)   P = {F,   L, Y}   Q = {H, I,   G,   H}
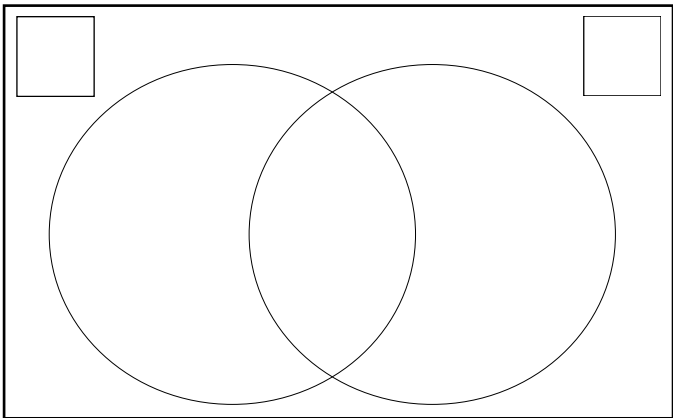
8)   M = {2, 4, 8, 16}   N = {2, 5,   8,   11,   13,   15}

9)   X = {S, A, I, L}   Y = {N, A, I, L}
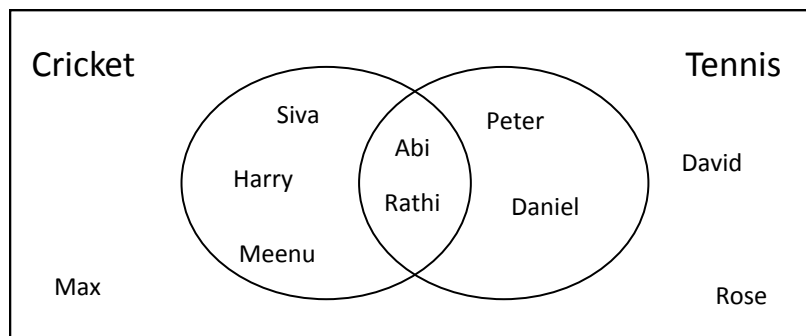

10)   A = {T, R, A, I, N}   B = {R, A, I, N}

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Venn Diagram Problems

Use the Venn diagram below to answer the following questions.

1) How many students have been surveyed?

   _____

2) Who only play Tennis?

   _____

3) Who only plays cricket?

   _____

4) Who play both cricket and tennis?

   _____

5) Who does not play cricket?

   _____

6) Who does not play Tennis?

   _____

7) Who neither plays Cricket nor plays Tennis?

   _____

8) Who does not play Cricket, but plays Tennis?
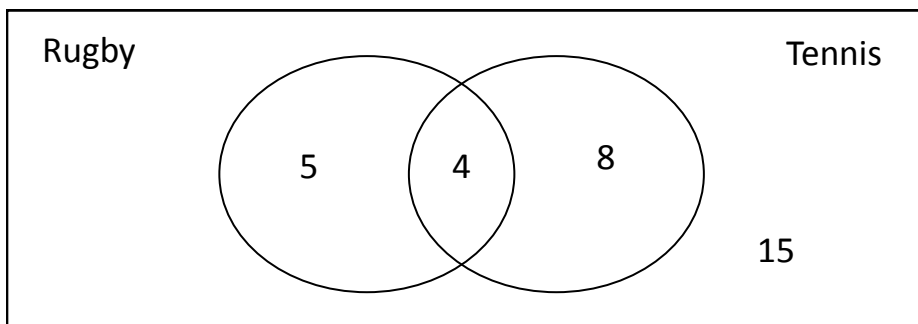
_____

9) Who does not play Tennis, but Cricket?

_____

10) Who either play Cricket or plays tennis but not both?

_____

| Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Use the Venn diagram below to answer the following questions.

1)   How many play Rugby?   _____

2)   How many play only Tennis?   _____

3)   How many are there in the class?   _____

4)   How many play only Rugby?   _____

5)   How many play both?   _____

6)   How many play neither?   _____

7)   How many do not play Rugby?   _____

8)   How many play Tennis but not Rugby?   _____

9)   How many do not play Tennis?   _____

10)   How many play Rugby but not Tennis?   _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

The probability scale

impossible	possible	evens	probable	certain
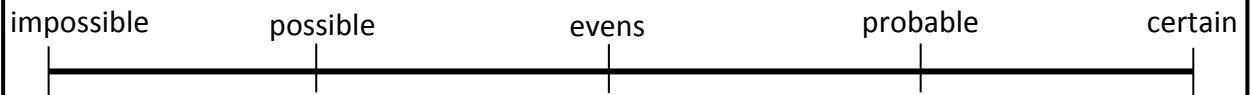
If an event is impossible, we say that there is a probability of 0

If an event is certain, it has a probability of 1.

If an event has an even chance, then it has a probability of 1 in 2 or $\dfrac{1}{2}$

The probability of an event happening

The probability (P) of an event happening is:

$$P = \frac{number\ of\ successful\ events}{total\ number\ of\ all\ possible\ results}$$

Example

Nine counters numbered 1, 2, 3, 4, 5, 6, 7, 8, 9 are placed in a box. If one counter is drawn out at random, what is the probability that it is a counter with a number divisible by 3?

Number of successes = 3: these are 3, 6 and 9

Total number of possibilities = 9

$$\therefore\ P = \frac{3}{9} = \frac{1}{3}$$

Probability of Events

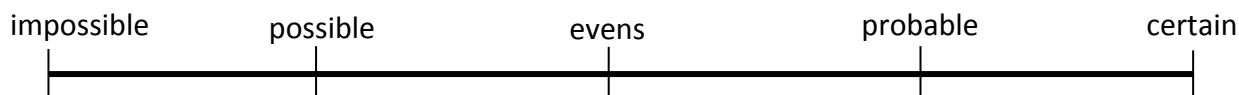**Example:** The probability that there is life on the moon is:

impossible	possible	evens	probable	certain
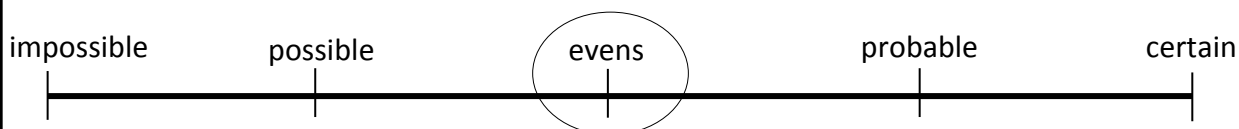
Mark on the scale, the probability of these events happening.

1)   I will get tail when I toss a coin.

impossible	possible	evens	probable	certain

2)   It will snow tonight.

impossible	possible	evens	probable	certain

3)   The lion will fly.

impossible	possible	evens	probable	certain
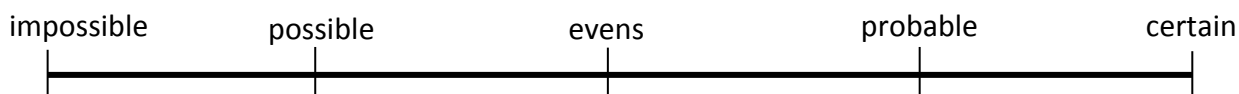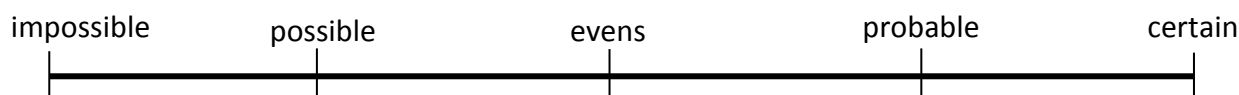
4)   Christmas will fall on 25th December this year.

impossible	possible	evens	probable	certain
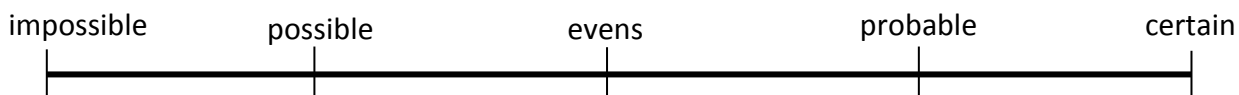
5)   At the age of 5, you grow another leg.

impossible	possible	evens	probable	certain
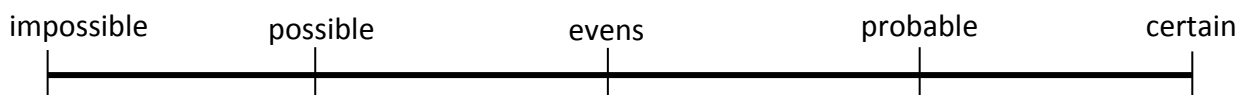
6) Everyone's birthday is the day they were born.

impossible	possible	evens	probable	certain
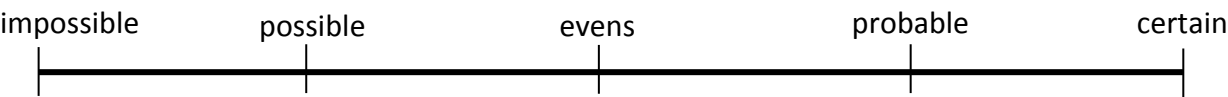
7) You toss a coin and get a head.

impossible	possible	evens	probable	certain
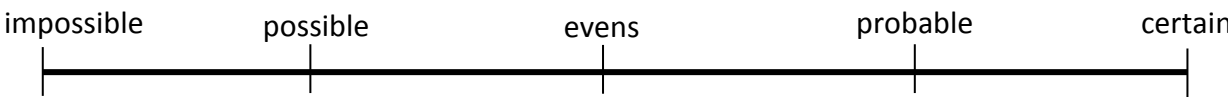
8) If today is Friday, tomorrow is Saturday.

impossible	possible	evens	probable	certain

9) It will rain tomorrow.

impossible	possible	evens	probable	certain
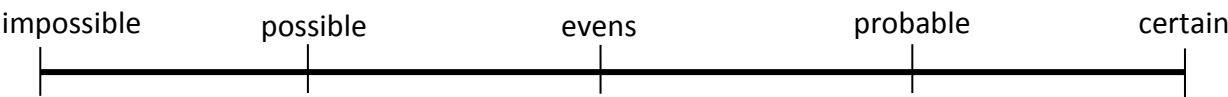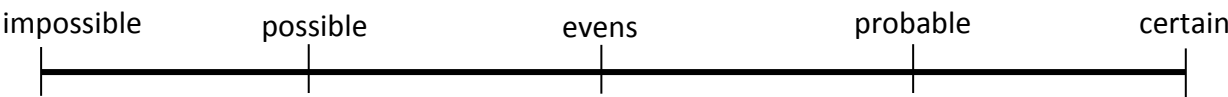
10) You can live in the past.

impossible	possible	evens	probable	certain
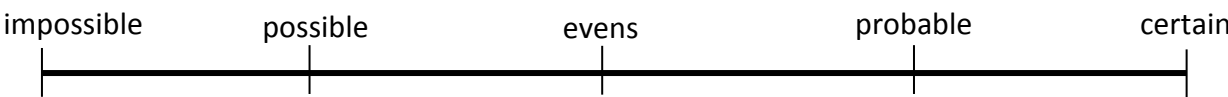
Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Example: What is the probability of throwing a six with a normal die?

Answer: In a normal die there is six numbers. So Probability is $\dfrac{1}{6}$

Complete the following questions. Remember to simplify your answers where appropriate.

1) Six counters numbered 1,3, 4, 5, 8, 9 are placed in a box. If one counter is drawn out random, what is the probability that it is a counter:

   a) with an odd number _____

   b) with an even number _____

2) If a dice (numbers 1 to 6) is thrown, what is the probability that the score is:

   a) A prime number _____

   b) A square number _____

3) When one card is chosen at random from normal pack of cards, what is the probability of choosing diamond?

   _____

4) If a letter is chosen at random from the word PROBABILITY , what is the probability that it will be B?

   _____

5) Twelve counters labelled A, B, C, D, E, F, G, H, I, J, K, L are placed in a box. If one counter is drawn out at random, what is the probability that it is a counter:

   a) with a consonant letter _____

   b) with a vowel letter _____

6) In a classroom 20 boys and 15 girls are there. The teacher selects a student randomly for the cultural event, what is the probability for the following:

a) A boy _____

b) A girl _____

7) If two coins are tossed simultaneously, what is the probability of:

a) two heads _____

b) two tails _____

c) one head and one tail _____

8) When a normal die is rolled, what is the probability that it will give a square number?

_____

9) In a bus, there are 16 adults and 23 children. The bus driver is picking a person at random, what is the probability that it will be an adult?

_____

10) There are 5 yellow counters, 2 red counters and 10 blue counters. I select a counter randomly without looking. What is the probability that I will select:

a) A blue counter _____

b) A red counter _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Probability of an event not happening

Example: If the probability of coming to school is $\frac{1}{4}$ what is the probability that he is not coming to the school?

$$\text{P(Event)} + \text{P(not that event)} = 1 \longrightarrow \text{P (not coming)} = 1 - \frac{1}{4} = \frac{3}{4}$$

Complete the following questions. Remember to simplify your answers where appropriate.

1)   If a normal die is rolled, what is the probability of throwing:

   a) less than four   _____   b) not 5   _____

   c) not a prime number   _____

2)   If a card is withdrawn at random from a pack of 52 playing cards, what is the probability that it is:

   a) An ace   _____   b) not an ace   _____

   c) a picture card   _____   d) not a picture card   _____

3)   A class of 30 boys contains 18 with dark hair, 8 with blonde hair, and 4 with red hair. If the class proceeds to the assembly hall in random order, what is the probability that the first to enter the hall has:

   a) dark hair   _____   b) non dark hair   _____

   c) red hair   _____   d) non red hair   _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Complete the following questions. Remember to simplify your answers where appropriate.

1)   What is the probability of throwing a four with a normal die?

                                                        _____

2)   Six counters numbered 2,7, 8, 9, 10, 11 are placed in a box. If one counter is drawn out
        random, what is the probability that it is a counter:

        a) with an prime number   _____   b) with an odd number   _____

3)   If a dice (numbers 1 to 6) is thrown, what is the probability that the score is:

        a) An odd number   _____   b) A prime number   _____

4)   When one card is chosen at random from normal pack of cards, what is the
        probability of choosing clubs?

                                                        _____

5)   If a letter is chosen at random from the word CONDITIONAL, what is the
        probability that it will be N?

                                                        _____

6)   If a normal die is rolled, what is the probability of throwing:

        a) less than five   _____   b) not 6   _____

        c) not a even number   _____

7) If a card is withdrawn at random from a pack of 52 playing cards, what is the probability that it is:

a) A club _____

b) not a diamond _____

c) not a picture card _____

d) not an ace card _____

8) A class of 40 boys contains 20 with dark hair, 12 with blonde hair, and 8 with red hair. If the class proceeds to the assembly hall in random order, what is the probability that the first to enter the hall has:

a) dark hair _____

b) non dark hair _____

c) red hair _____

d) non red hair _____

9) When one card is chosen at random from normal pack of cards, what is the probability of choosing diamonds?

_____

10) If a dice (numbers 1 to 6) is thrown, what is the probability that the score is:

a) An even number _____

b) A triangular number _____

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

LINE SYMMETRY

A shape has line symmetry if a central dividing line can be drawn to show that both sides are the same.
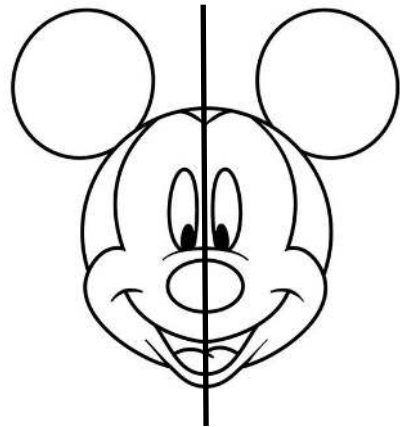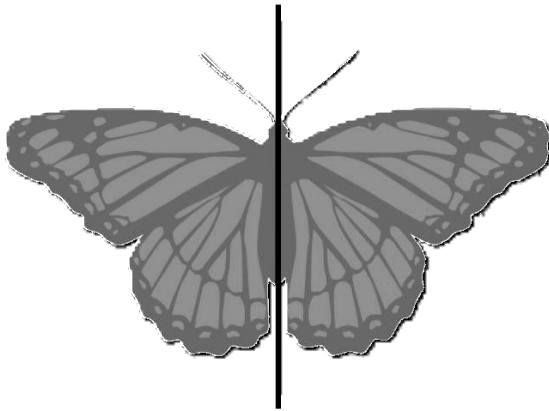
Line of Symmetry
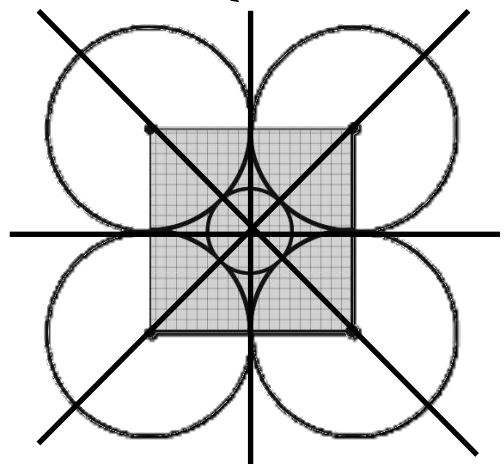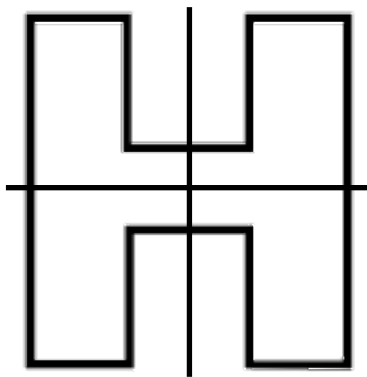
Some shapes have more than one line of symmetry

Rotational Symmetry

A figure has **rotational symmetry** if you can turn it round a fraction of a turn so that it then looks the same.

The order of **rotational symmetry** is equal to the number of times that the shape will look the same in one full turn.

Example 1

A

Original
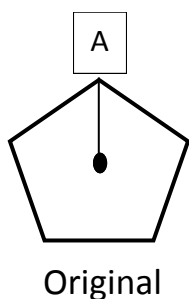
This shape has rotational symmetry.
Order of rotation is 5.

A

Turn 1

A

Turn 2

A

Turn 3

A

Turn 4

A

Turn 5
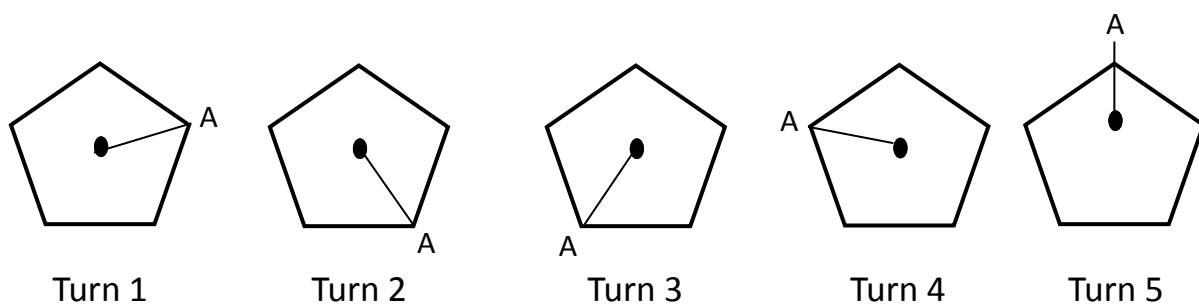
Example 2

Order of rotation is 3

A

Original

A

Turn 1

A

Turn 2

A

Turn 3
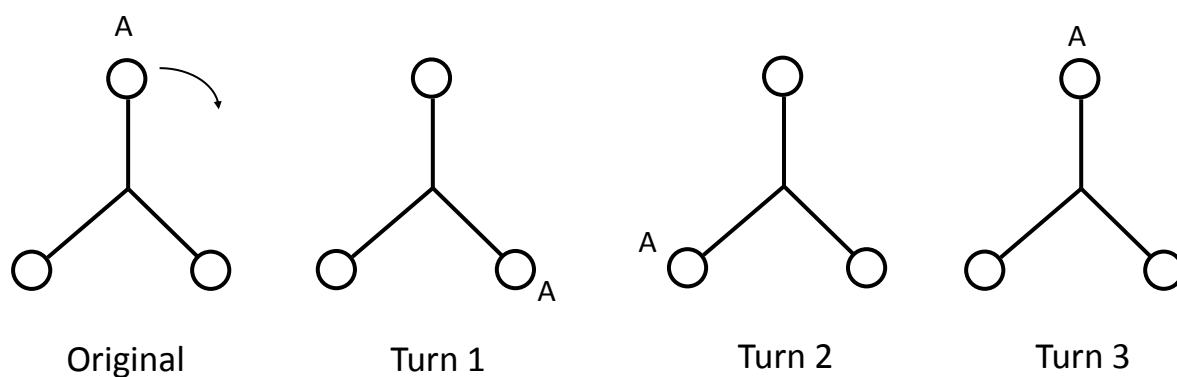
These patterns all have line of symmetry. Draw the lines of symmetry on the picture.

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)
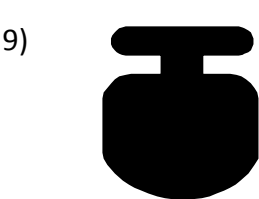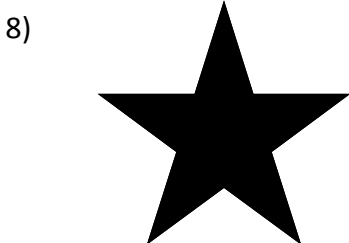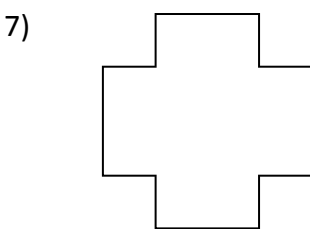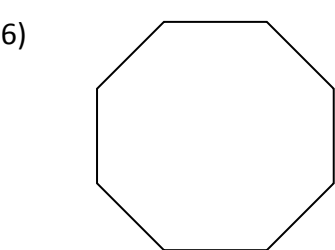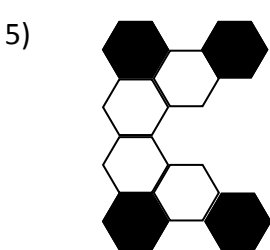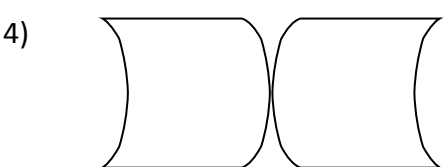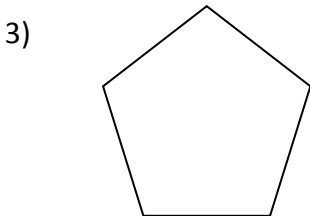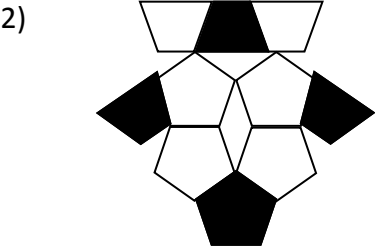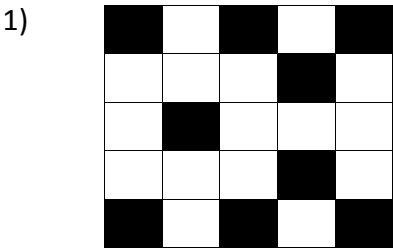
Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Exercise 6.2

These patterns are partly completed. Fill in the missing squares so that pattern is symmetrical about the line of symmetry shown.

1)

2)

3)
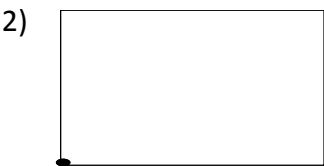
4)

5)

6)

7)

8)

9)

10)

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

For these diagrams with rotational symmetry write down the order.

1)

2)

3)

4)
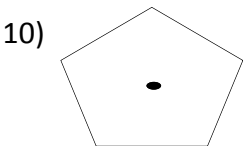
5)

6)

7)

8)

9)

10)

11)

12)
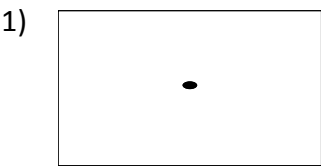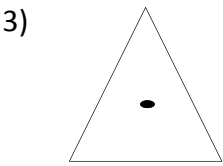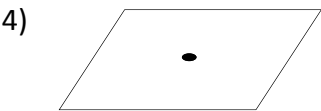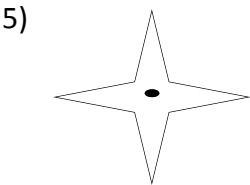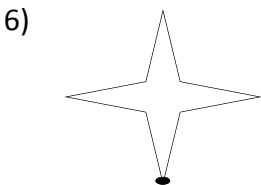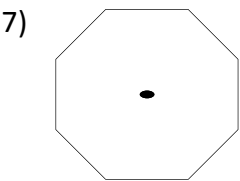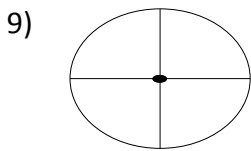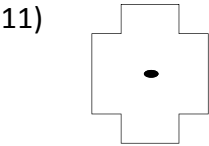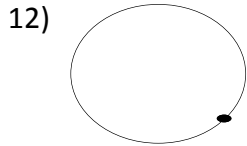
Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

These shapes all have line of symmetry. Draw the lines of symmetry on the shapes.

1)

2)
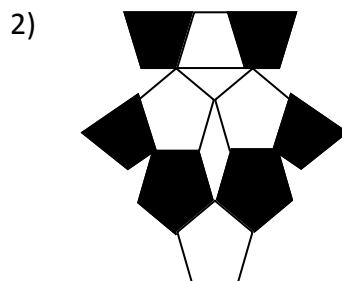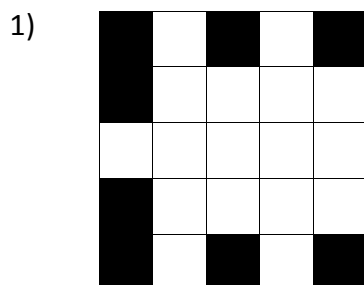
These patterns are partly completed. Fill in the missing squares so that they form the mirror image.
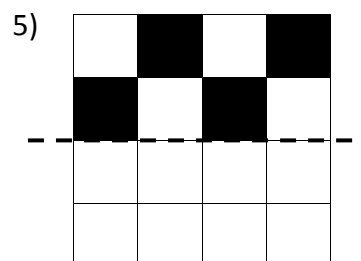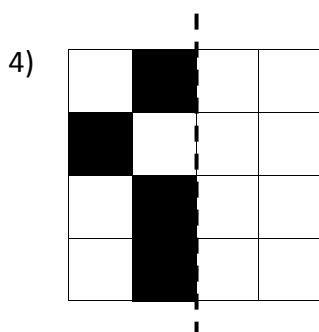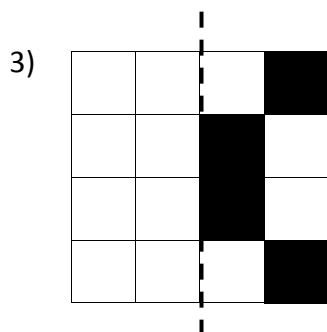
3)

4)

5)
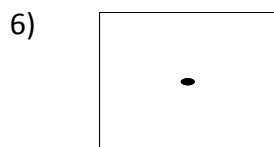
For these diagrams with rotational symmetry write down the order.

6)

7)

8)

9)

10)

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

(x) Axis

(x,y)
A (3,2)

(y) Axis

Origin

Example

8

A

7

B

6

5

C

4

3

2

1

1   2   3   4   5   6   7   8
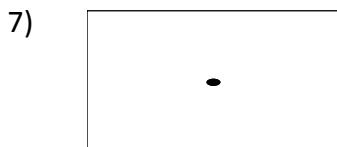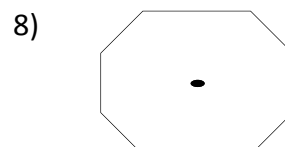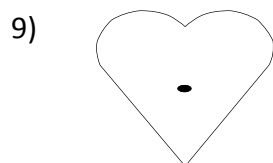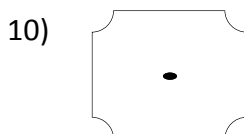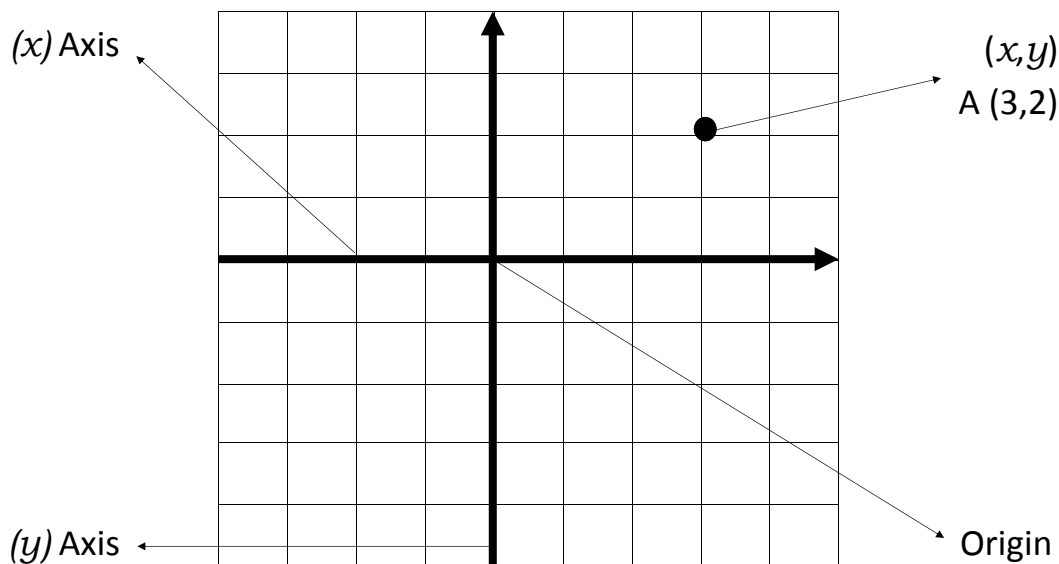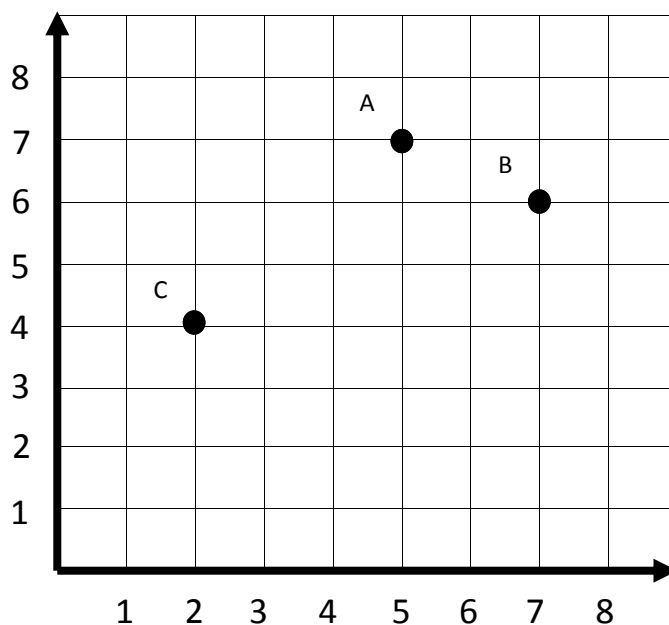
What are the coordinates of the points A, B and C?

A (5,7)   B (7,6)   C (2, 4)

Answer the following questions.
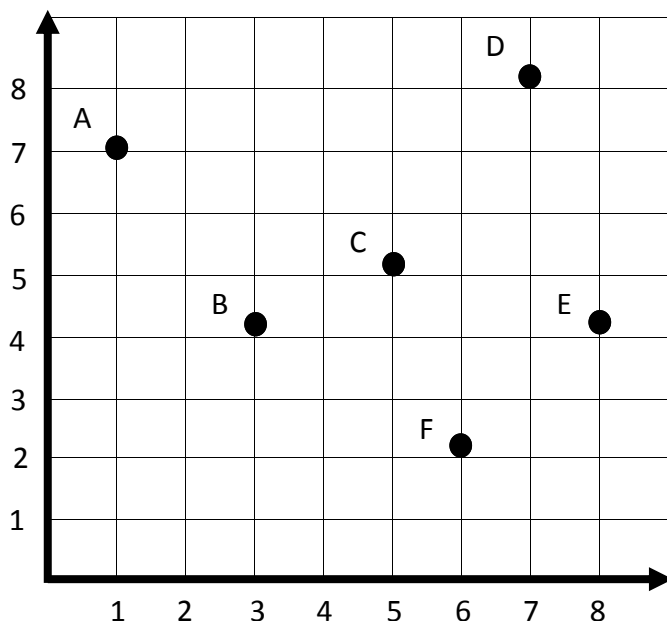
1) Write down the x coordinate of F?

_____

2) Write down the y coordinate of D?

_____

3) Write down the coordinate of C?

_____

4) Write down the x coordinate of B?

_____

5) Write down the y coordinate of E

_____

6) Find the difference in the x coordinate of F and B

_____

7) Find the difference in Y coordinate of A and F

_____

8)
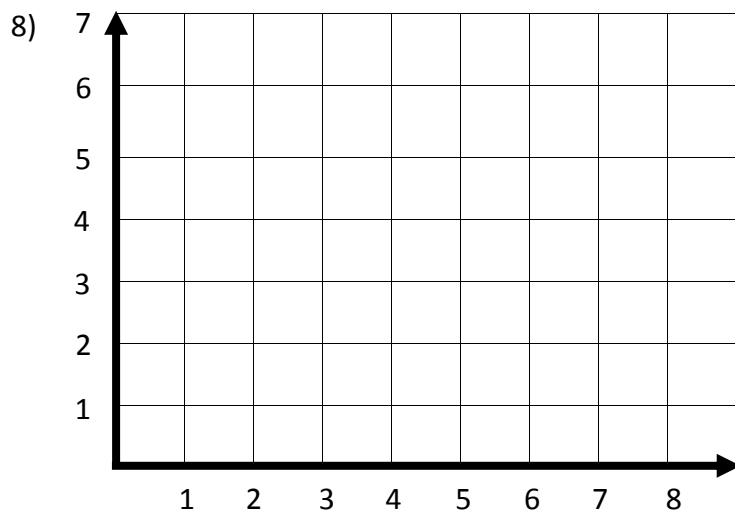
Mark the points; P(1,2), Q(7,2), R(8,5) and S(2,5) on the grid.

Join P to Q, Q to R, R to S and S to P.

A) What is the name of the figure PQRS?

_____

B) Does this shape have any line of symmetry?

_____
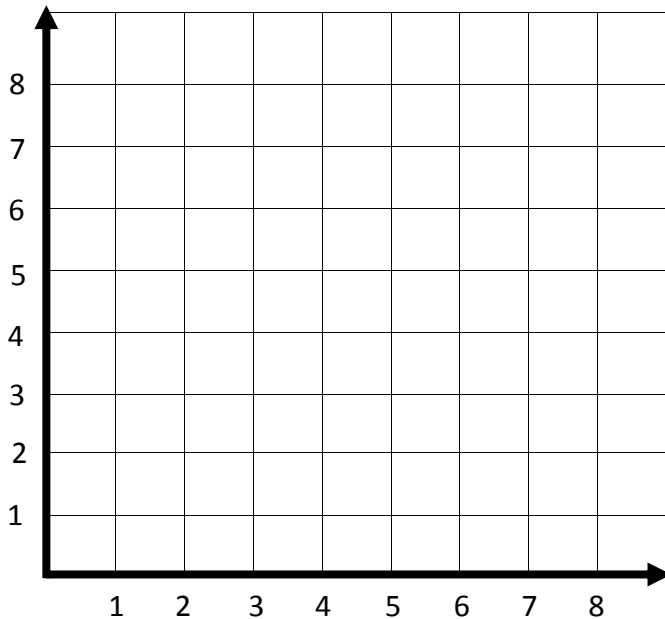
Mark these points on the grid on the left:

A(1,7)   B(1,2)
C(8,2)   D(8,4)
E(3,4)   F(3,7)

Join the points in alphabetical order, starting from A and finishing at A.

What letter have you drawn?

_____

10) Mark these points on the grid on the right:

P(2,6)   Q(4,8)

R(6,6)   S(4,1)

Join the points in alphabetical order from P to P.

A) What shape is PQRS?

_____

B) The shape has a line of symmetry, draw it on your grid.
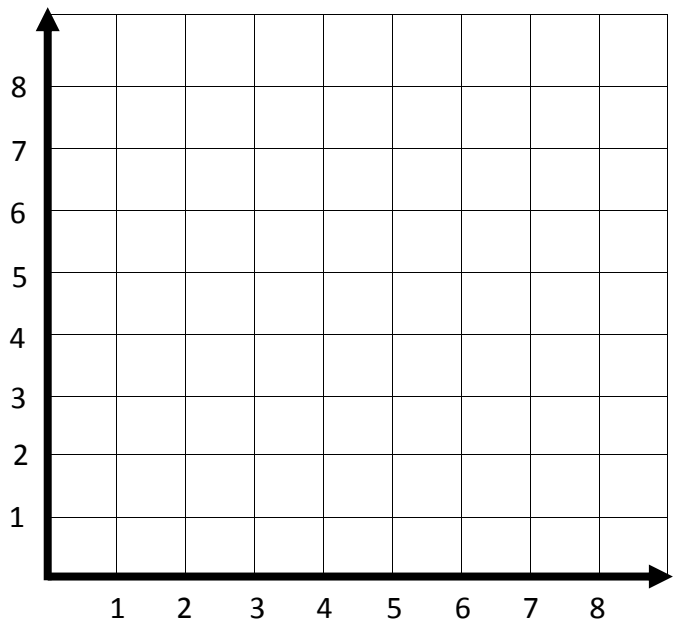
Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

Missing Length

Find the length of the missing side (a).

1)

a cm   32cm^2

8cm

a = _____ cm

2)

10 cm

a cm   56 cm^2

4 cm

a = _____ cm

3)

7cm   63cm^2

a cm
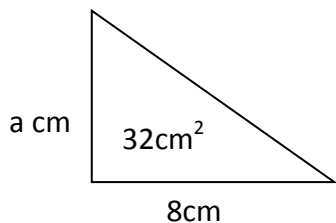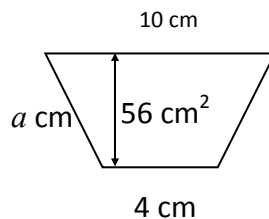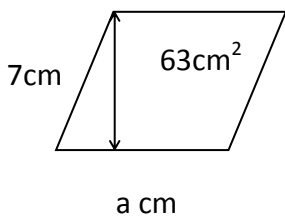
a = _____ cm

Missing Side

Find the value of the missing measurement.

1)	14m	5m	210m^3
2)	7m	600cm	420m^3
3)	6m	1000cm	480m^3

Find the volume in cm^3, of each of these solids.

= 1cm^3

1)

V =

2)

V =

3)

2.5cm

5cm

1cm

V =

4)

4cm

6cm

2cm

V =
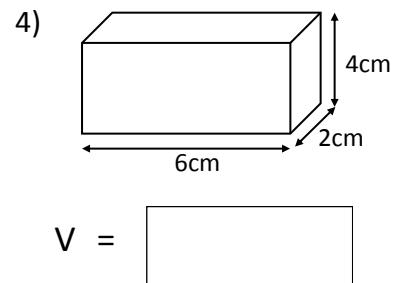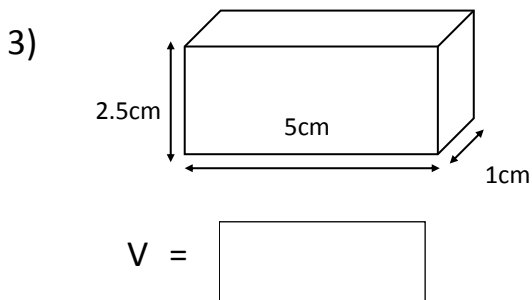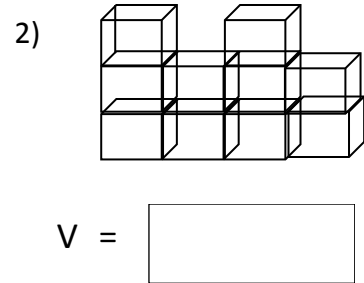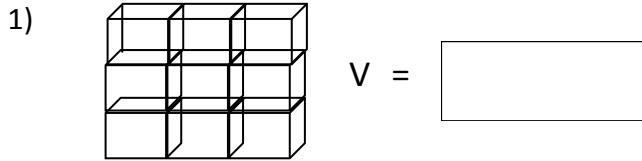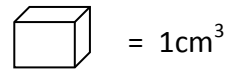
Convert the values for the following questions to the correct units.

1)   89km   to   m   2)   132km   to   m

3)   40km   to   m   4)   240km   to   m

5)   200km   to   m   6)   54000m   to   km

7)   23000m   to   m   8)   65000m   to   km

9)   93000m   to   m   10)   7900m   to   km

Convert the values for the following questions to the correct units.

1) 470 *days*   to   [   ] *year*   [   ] *days*

2)   1456m   to   [   ] *km*   [   ] *m*

3)   2678cm   to   [   ] *m*   [   ] *cm*

4)   3450g   to   [   ] *kg*   [   ] *g*

5)   95mm   to   [   ] *cm*   [   ] *mm*

6)   2378g   to   [   ] *kg*   [   ] *g*

7)   1500cm   to   [   ] *m*   [   ] *cm*

Drawing Venn Diagrams

For the following questions, draw a Venn diagram in the space given, using the information provided.

1)   P = {H, A, I, R}   Q = {H, E, R, O}
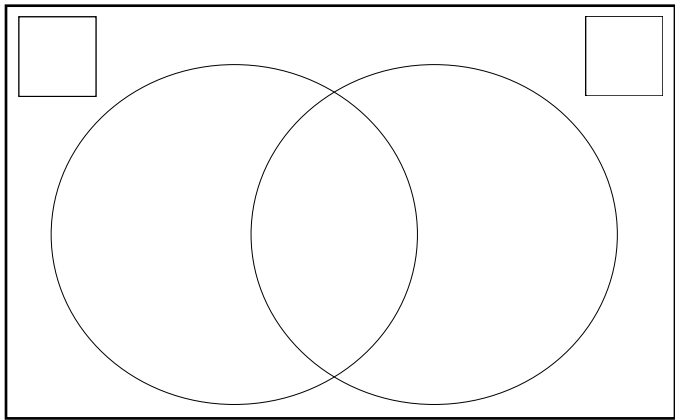
2)   M = {T, O, W, E, L}   N = {O, W, E, K, M}
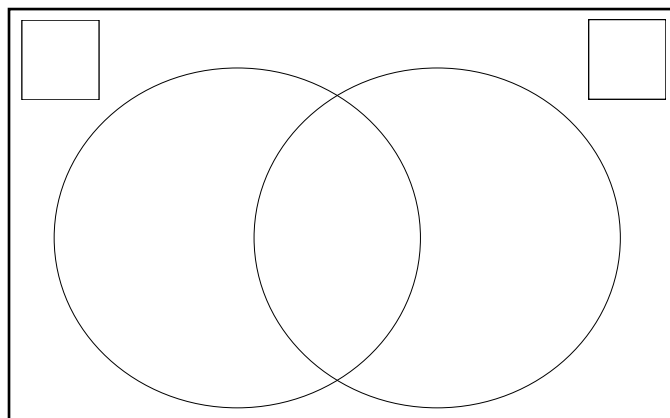
3)   A = {Bats, Stumps, Ball}   B = {Racquets, Net, Ball}
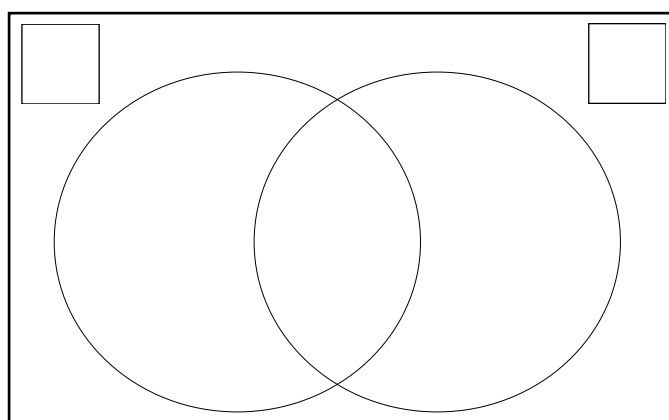
4)   P = {5, 1, 3, 7}   Q = {1, 3, 6, 10}
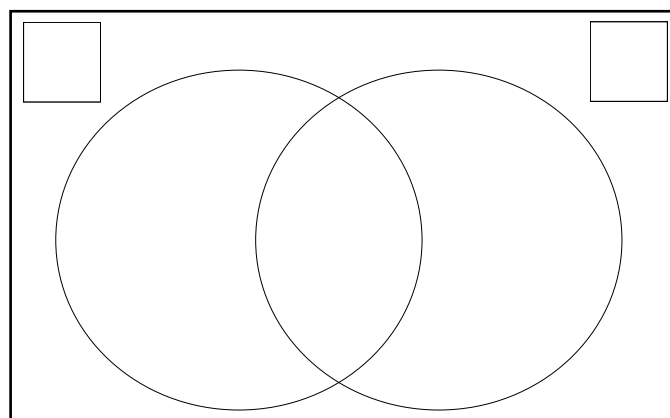
5)   A = {2, 4, 6, 8}   B = {1, 3, 5, 7}
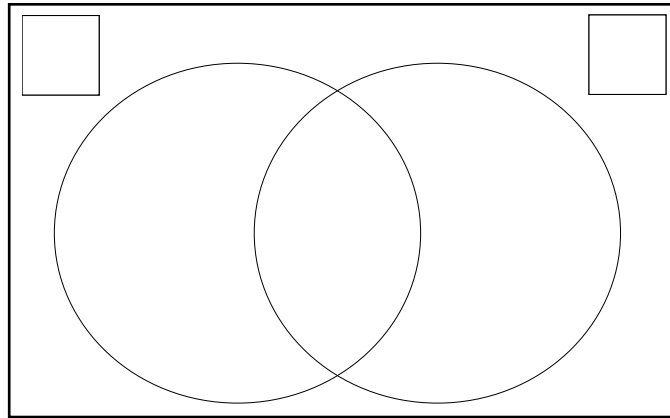
Probability of an event not happening

Complete the following questions. Remember to simplify your answers where appropriate.

If a dice is thrown, what is the probability that the score is:

a)   an even number   _____

b)   not an even number   _____

c)   a triangular number   _____

d)   not a triangular number   _____

These patterns are partly completed. Fill in the missing squares so that pattern is symmetrical about the line of symmetry shown.

11)

12)

Attempts	No. of Corrections	Date	Sign
Attempt 1			
Attempt 2			

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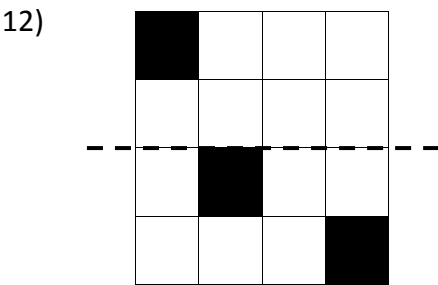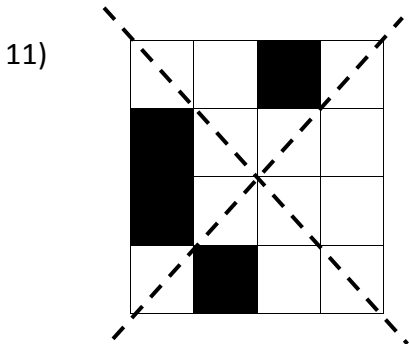| NO	Year Group	NAME	STATUS	AUTHOR
1	2	English Classwork Book	Published	R. Myra
2	2	English Homework Book	Published	R. Myra
3	3	Mathematics Classwork Book	Published	M. Nat
4	3	Mathematics Homework Book	Published	M. Nat
5	3	English Book 1	Published	J. Suki
6	3	English Book 2	Published	J. Suki
7	4	Mathematics Classwork Book	Published	M. Nat
8	4	Mathematics Homework Book	Published	M. Nat
9	4	Verbal Reasoning Book 1	Published	M. Nat
10	4	Non-Verbal Reasoning	Published	M. Nat
11	5	Mathematics Book 1	Published	M. Nat
12	5	Mathematics Book 2	Published	M. Nat
13	5	Mathematics Book 3	Published	M. Nat
14	5	Mathematics Book 4	Published	M. Nat
15	5	Mathematics Book 5	Published	M. Nat
16	5	Verbal Reasoning Book 1	Published	M. Nat
17	5	Verbal Reasoning Book 2	Published	M. Nat
18	5	Verbal Reasoning GLS Book	Published	M. Nat
19	5	Comprehension Book 1	Published	R. Myra
20	5	Non Verbal Reasoning Book 1	Published	M. Nat
21	5	Non Verbal Reasoning Book 2	Published	M. Nat
22	6	Mathematics Classwork Book	Published	M. Nat
23	6	Mathematics Arithmetic Book	Published	M. Nat
24	6	Maths Practice Paper Book	Published	M. Nat
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*   Year 9   *   Year 10 & 11   *   Year 12 & 13

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