LEVEL 6

N19 Fractions, Decimals and Percentages

1) Complete the tables.

a)

Fraction	Decimal	Percentage
		50%
	0.25	
$\frac{1}{10}$		
$\frac{1}{3}$		
	0.7	
		40%

b)

Fraction	Decimal	Percentage
$\frac{68}{100}$		
		35%
	0.6	
	$0.\dot{6}$	
		5%
$\frac{13}{50}$		

2) Put these fractions, decimals and percentages in order, smallest to largest.

a) $\frac{1}{2}$, 49%, $\frac{3}{5}$, 0.55

b) 27%, 0.2, $\frac{1}{4}$, $\frac{3}{10}$

c) $\frac{9}{10}$, 95%, 0.99, $\frac{97}{100}$

d) $\frac{1}{3}$, 0.6, $\frac{2}{3}$, 30%

e) 0.125, 10%, $\frac{11}{100}$, 0.09

3) Chris says that $\frac{3}{4}$ is halfway between 0.5 and 100%.

Is Chris correct? You must explain your answer.

4) Emily says that 0.2 is halfway between 10% and $\frac{3}{5}$.

Is Emily correct? You must explain your answer.

Level 6

N20 Improper Fractions and Mixed Numbers

1) Convert the following improper fractions to mixed numbers.

a) $\frac{5}{4}$

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

c) $\frac{12}{7}$

d) $\frac{20}{9}$

e) $\frac{16}{5}$

f) $\frac{25}{3}$

g) $\frac{30}{7}$

h) $\frac{75}{8}$

i) $\frac{47}{12}$

j) $\frac{100}{9}$

2) Convert the following mixed numbers to improper fractions.

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

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

c) $5\frac{2}{3}$

d) $3\frac{3}{5}$

e) $11\frac{2}{7}$

f) $10\frac{1}{9}$

g) $7\frac{5}{8}$

h) $9\frac{4}{5}$

i) $6\frac{3}{11}$

j) $12\frac{3}{4}$

3) Put these numbers in order, lowest to highest.

a) 3.5, $3\frac{1}{5}$, $\frac{11}{3}$

b) $7\frac{1}{4}$, 7.14, $\frac{34}{5}$

c) $1\frac{1}{10}$, 98%, $\frac{5}{4}$, 1

Level 6

N21 Prime Numbers, HCF and LCM

1) Split up the following numbers into the product of their prime factors.

a) 12
b) 45
c) 72
d) 120
e) 550
f) 1296

2) Find the Highest Common Factor (HCF) of the following numbers.

a) 4 and 6
b) 8 and 16
c) 36 and 48
d) 300 and 525
e) 374 and 918
f) 45, 90 and 105

3) Find the Lowest Common Multiple (LCM) of the following numbers.

a) 8 and 12
b) 30 and 45
c) 15 and 18
d) 4, 6 and 8
e) 24 and 84
f) 72 and 96

4) The bells at Kings School ring every 6 minutes.

At Queens School the bells ring every 5 minutes.

At Princess School the bells ring every 9 minutes.

All three bells ring together at 8.30 am.

When is the next time the bells of the three schools will ring together?

C22 Percentage of an Amount

1) Work out the following:

a) 50% of 80

b) 50% of 48

c) 50% of 15

d) 25% of 120

e) 25% of 90

2) Work out the following:

a) 10% of 150

b) 10% of 26

c) 50% of 12

d) 25% of 12

e) 75% of 12

3) Work out the following:

a) 10% of £40

b) 5% of £40

c) 15% of £40

d) 5% of £70

e) 15% of £380

4) Work out the following:

a) 20% of £50

b) 45% of £9

c) 80% of £11

d) 35% of £6

e) 65% of £824

5) Jamie received £26 pocket money last week.

He spent it as follows: __ 10% on sweets,

__ 25% on magazines

__ 15% on games

How much did Jamie have left?
Show your working.

6) Tony had £40 saved up and gave 35% of it to his younger sister, Ella.

Ella gave 20% of what she was given to her younger brother, Ben.

Ben gave 30% of what he was given to his younger brother, Tim.

Tim spent 75% of what he was given on buying a toy for his hamster, Hammy.

How much was the toy for Hammy?

Level 6

C23 Percentage Increase and Decrease

1) Describe how you would increase a number by 10%.

2) Describe how you would decrease a number by 10%.

3) Increase the following numbers by 10%

a) 40
b) 140
c) 810
d) 320
e) 75
f) 505
g) 12
h) 123

4) Decrease the following numbers by 10%

a) 20
b) 160
c) 80
d) 190
e) 25
f) 445
g) 13
h) 7

5) Work out the following:

a) Increase £400 by 5%
b) Decrease £120 by 15%
c) Decrease 500 km by 20%
d) Increase 96 kg by 10%
e) Increase 250 m by 50%
f) Decrease £820 by 75%
g) Increase 60 kg by 60%
h) Decrease £26 by 35%

6) A shop is having a sale and all prices are reduced by 25%.

a) Work out the sale price of an item normally priced at £18.40
b) Work out the sale price of an item normally priced at £99

Level 6

C24 Addition and Subtraction of Fractions

1) Work out the following, simplifying your answers where possible.

a) $\frac{2}{7} + \frac{3}{7} = \frac{\square}{7}$

b) $\frac{3}{8} + \frac{1}{8} =$

c) $\frac{7}{9} - \frac{2}{9} = \frac{\square}{9}$

d) $\frac{5}{10} - \frac{1}{10} =$

e) $\frac{1}{6} + \frac{2}{3} = \frac{\square}{18} + \frac{\square}{18} =$

f) $\frac{1}{6} + \frac{2}{3} = \frac{\square}{6} + \frac{\square}{6} =$

g) $\frac{4}{5} - \frac{1}{2} =$

h) $\frac{14}{15} - \frac{3}{5} = \frac{\square}{15} - \frac{\square}{15} =$

2) Work out the following, simplifying your answers where possible.

a) $\frac{3}{8} + \frac{4}{8} =$

b) $\frac{9}{11} - \frac{5}{11} =$

c) $\frac{1}{2} + \frac{1}{3} =$

d) $\frac{5}{7} - \frac{3}{5} =$

e) $\frac{1}{2} + \frac{2}{5} =$

f) $\frac{5}{6} - \frac{1}{4} =$

g) $\frac{5}{12} + \frac{1}{6} =$

h) $\frac{4}{5} - \frac{1}{10} =$

i) $\frac{3}{8} + \frac{1}{2} =$

j) $\frac{8}{9} - \frac{5}{6} =$

2) Write the missing numbers in each of these fraction sums.

a) $\frac{1}{3} + \frac{\square}{6} = 1$

b) $\frac{3}{7} + \frac{12}{\square} = 1$

c) $\frac{8}{5} - \frac{\square}{15} = 1$

d) $\frac{15}{\square} - \frac{1}{4} = 1$

Level 6

C25 Multiplication and Division of Integers by Fractions

1) Work out the following, giving your answers in their simplest forms

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

b) $7 \times \frac{1}{7}$

c) $2 \times \frac{4}{5}$

d) $9 \times \frac{1}{3}$

e) $4 \times \frac{4}{9}$

f) $10 \times \frac{3}{8}$

g) $\frac{8}{9} \times 6$

h) $\frac{2}{15} \times 3$

2) Work out the following, giving your answers in their simplest forms

a) $\frac{1}{2}$ of £40

b) $\frac{1}{5}$ of 20 km

c) $\frac{1}{4}$ of 120 kg

d) $\frac{1}{9}$ of £99

e) $\frac{2}{5}$ of 30 cm

f) $\frac{7}{8}$ of £16

g) $\frac{4}{7}$ of 7000 g

h) $\frac{3}{4}$ of £500

3) Work out the following, giving your answers in their simplest forms

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

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

c) $12 \div \frac{1}{3}$

d) $9 \div \frac{1}{5}$

e) $10 \div \frac{2}{3}$

f) $8 \div \frac{4}{5}$

g) $3 \div \frac{5}{7}$

h) $15 \div \frac{2}{3}$

4) An industrial machine takes $\frac{3}{4}$ of an hour to produce a very special tool. How long would it take the machine to produce 12 of the tools?

5) A road is 20 km long. Road signs are to be installed every $\frac{2}{3}$ of a kilometre. How many signs will be needed?

Level 6

A7 Substitution

1) Using $a = 3$, work out

a) $a + 5$ d) $2a + 1$

b) $7 - a$ e) $13 - \frac{a}{3}$

c) $6a$ f) $a^2 + 2a - 20$

2) Using $x = 5$ and $y = 2$, work out

a) $x - y$ d) $5y - 5x$

b) $y - x$ e) $x^2 + 3y$

c) $3x + 2y$ f) $\frac{4x}{y} - xy$

3) Using $a = 3$, $b = 1$ and $c = -2$, work out

a) $a + b + c$ d) $ab - c$

b) $2b + c$ e) $ac + 5b$

c) $c - a + b$ f) $c^2 - 2ab$

4) Using $x = 3$, work out

a) $x^2 - 2x$

b) $2x^2 + x + 1$

c) $x^3 - 2x^2 - 5$

5) If $\pi = 3.142$ and $r = 9$, work out

a) $2\pi r$

b) πr^2

Level 6

A8 Trial and Improvement

1) Using a trial and improvement method, solve the equation $x^2 - x = 56$

You must show ALL your working.

2) Using a trial and improvement method, solve the equation $x^2 + 4x = 21$

You must show ALL your working.

3) Using a trial and improvement method, solve the equation $x^3 + 2x = 72$

You must show ALL your working.

4) Using a trial and improvement method, solve the equation $x^3 - 3x = 110$

You must show ALL your working.

Level 6

A9 Algebraic Simplification

1) Simplify these expressions

a) $3a + 4a =$

b) $b + 4b =$

c) $5x - x =$

d) $6d + 3d - 2d =$

e) $2k + k + k - 3k =$

f) $3r - 2r + 4r =$

g) $5t - 3t + t + 2t =$

h) $7p - p + 2p - 5p =$

i) $-4y + 2y - y + 4y =$

j) $-2c + c - 3c - c =$

2) Simplify these expressions

a) $a + b + a + b =$

b) $3a + 2a + 4b + b =$

c) $7x + 2y + x + 3y =$

d) $5r + 6p - 2r - 3p =$

e) $4c + 8d - 3c + d =$

f) $6x - 4y + 7y - 2x =$

g) $2k - 3l - k + 10l =$

h) $3m + 5n + 7m - 7n =$

i) $v - 4w - 5v - 2w =$

j) $-3x - y - 3y - x =$

3) Simplify these expressions

a) $7xy - 2xy =$

b) $5cd + 3dc =$

c) $x^2 + 4x^2 + 2x^2 =$

d) $9y^3 + y - 2y^3 =$

e) $3ab + 7ab - 2a =$

f) $6m + 2pr - m + 3rp =$

g) $10a^2d + 2y - 3da^2 + y^2 =$

h) $bz^2 + 4t^3 - 3t^3 - 5zb^2 =$

i) $2r^2b + 5r^2 - r + 6br^2 =$

j) $8x^3y + 2w - 5w - 3yx^3 =$

Level 6

A10 Linear Equations

1) Solve

a) $x + 5 = 8$

b) $x + 7 = 9$

c) $x - 3 = 12$

d) $x - 6 = 10$

e) $2 + x = 5$

f) $2x = 14$

g) $3x = 30$

h) $\frac{x}{2} = 8$

i) $\frac{x}{5} = 7$

j) $\frac{4x}{3} = 8$

2) Solve

a) $5x + 2 = 17$

b) $3x - 1 = 17$

c) $2x + 10 = 20$

d) $4x - 7 = 29$

e) $4 + 2x = 14$

f) $\frac{x}{2} + 3 = 7$

g) $\frac{x}{5} - 2 = 4$

h) $\frac{2x}{5} - 1 = 9$

i) $\frac{3x}{2} + 5 = 11$

j) $\frac{4x}{5} + 6 = 8$

3) Using the statement: *"I think of a number, double it, and subtract 1. I get 7."*

a) Form an equation.

b) Solve the equation to find the number that was thought of.

4) Using the statement: *"I think of a number, multiply it by 7, and add 3. I get 80."*

a) Form an equation.

b) Solve the equation to find the number that was thought of.

5) Using the statement: *"I think of a number, multiply it by 2, divide the result by 3 and then subtract 5. I get 5."*

a) Form an equation.

b) Solve the equation to find the number that was thought of.

Level 6

A11 Generate a Number Sequence

1) Write the first five terms of each sequence

a) Start at 1 and add 5

b) Start at 30 and subtract 4

c) Start at 11 and add 9

d) Start at 8 and subtract 4

e) Start at -10 and add 6

f) Start at 4 and subtract 3

2) For each sequence, describe the rule and find the next two terms

a) 5, 7, 9, 11, ___, ___

b) 11, 16, 21, 26, ___, ___

c) 22, 19, 16, 13, ___, ___

d) -1, 2, 5, 8, ___, ___

e) 6, 2, -2, -6, ___, ___

f) -42, -35, -28, -21, ___, ___

3) Here is a pattern made up of sticks

a) Write the pattern as a number sequence.

b) Describe the rule.

c) Find the next five terms of the sequence.

4) For each sequence, find the first 5 terms and the 10th term.

a) $3n - 1$

b) $n + 2$

c) $5n + 2$

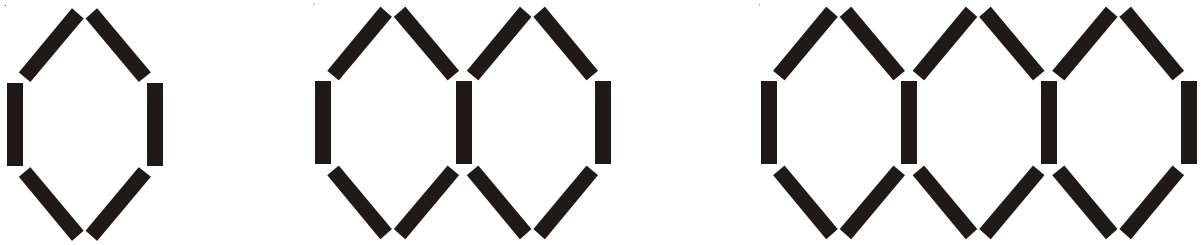
d) $4n - 7$

e) $10n + 9$

Level 6

A12 Finding the *n*th Term

1)



Pattern 1 Pattern 2 Pattern 3

a) Draw pattern 4

b) How many lines would be in Pattern 6?

c) How many lines would be in Pattern *n*?

2) Work out the *n*th term of the following number patterns.

a) 2, 4, 6, 8, ...

b) 3, 5, 7, 9, ...

c) 5, 8, 11, 14, ...

d) 1, 5, 9, 13, ...

e) 12, 22, 32, 42, ...

f) 2, 8, 14, 20, ...

g) 3, 4.5, 6, 7.5, ...

3) Write down the first four terms and the 10th term of the following number patterns.

a) $n \longrightarrow 3n$

b) $n \longrightarrow 3n + 2$

c) $n \longrightarrow n - 3$

d) $n \longrightarrow 2n + 5$

e) $n \longrightarrow 3n - 7$

f) $n \longrightarrow 5n + 3$

g) $n \longrightarrow 4n - 1$

Level 6

A13 Straight Line Graphs

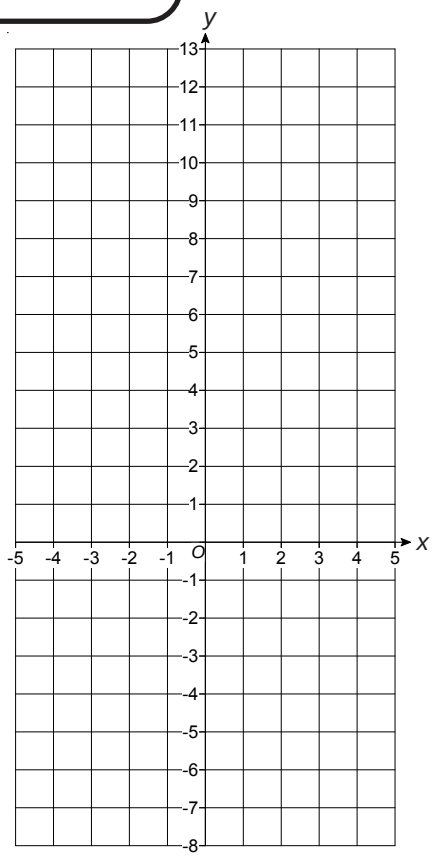
1) a) Complete the table of values for $y = 3x - 2$

x	-2	-1	0	1	2	3	4	5
y								

b) Plot the graph of $y = 3x - 2$

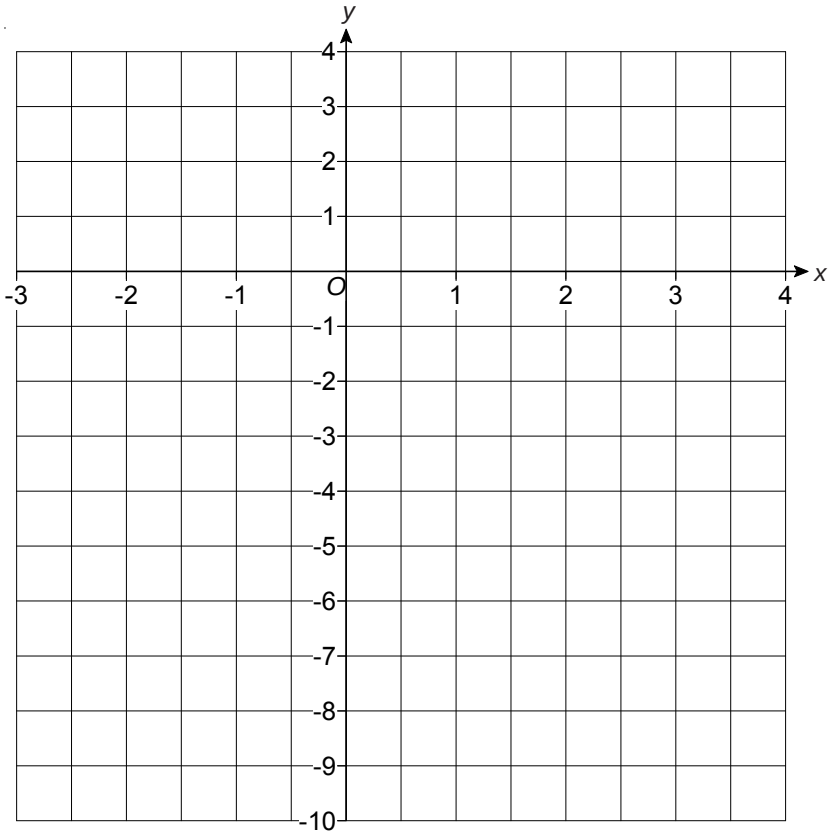
c) Use your graph to estimate the value of x when $y = 2$

d) Use the graph to estimate the value of x when $y = -4$



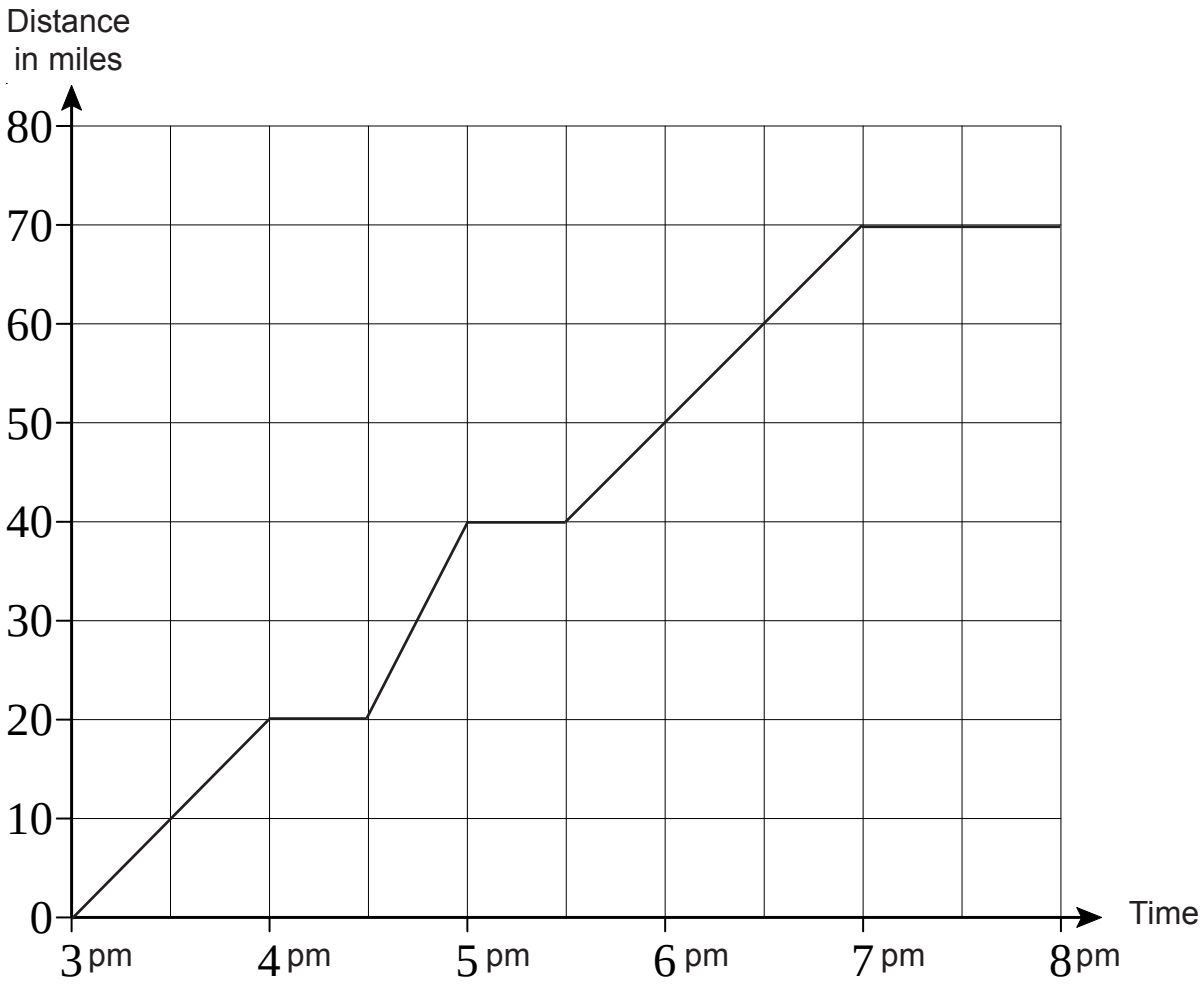
2) a) Plot the graph of $y = 2x - 4$

b) Plot the graph of $x + y = 1$



Level 6

A14 Distance - Time Graphs



The graph, above, shows Jade's journey by scooter from her house to university with some stops along the way.

a) How long did the journey take?

b) How many breaks did Jade take throughout her journey?

c) At what time did Jade take her first break?

d) How long did the first break last?

e) What was Jade's average speed between 3 pm and 4 pm?

f) What was Jade's average speed between 4.30 pm and 5 pm?

g) What was Jade's average speed between 5.30 pm and 7 pm?

Level 6

A15 Real Life Graphs

1) Use the conversion graph below to convert :

a) 80 km to miles

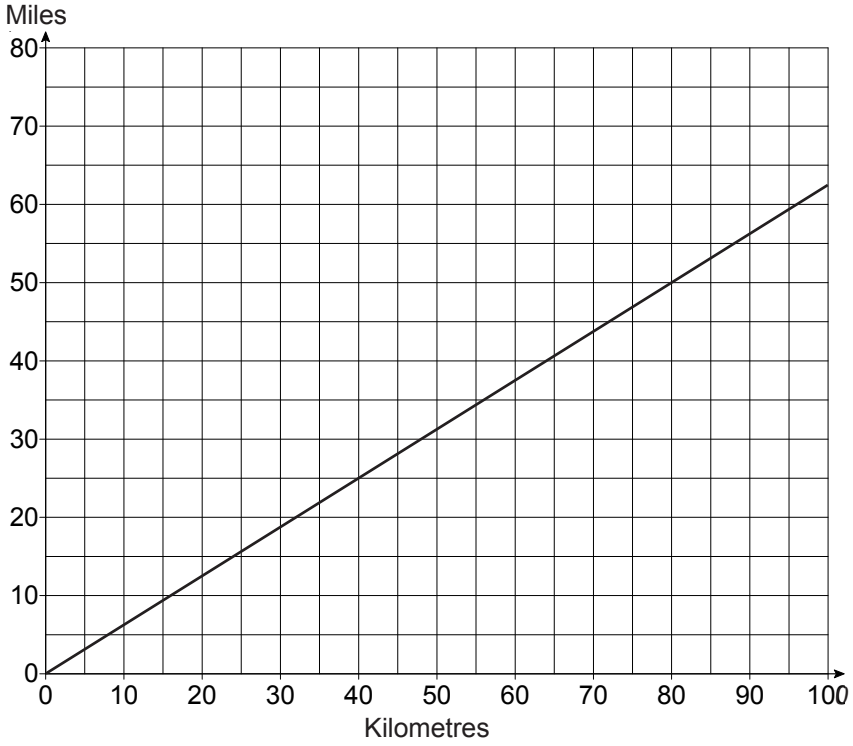
b) 35 miles to km

c) 40 km to miles

d) 60 miles to km

e) 100 miles to km

f) 140 km to miles

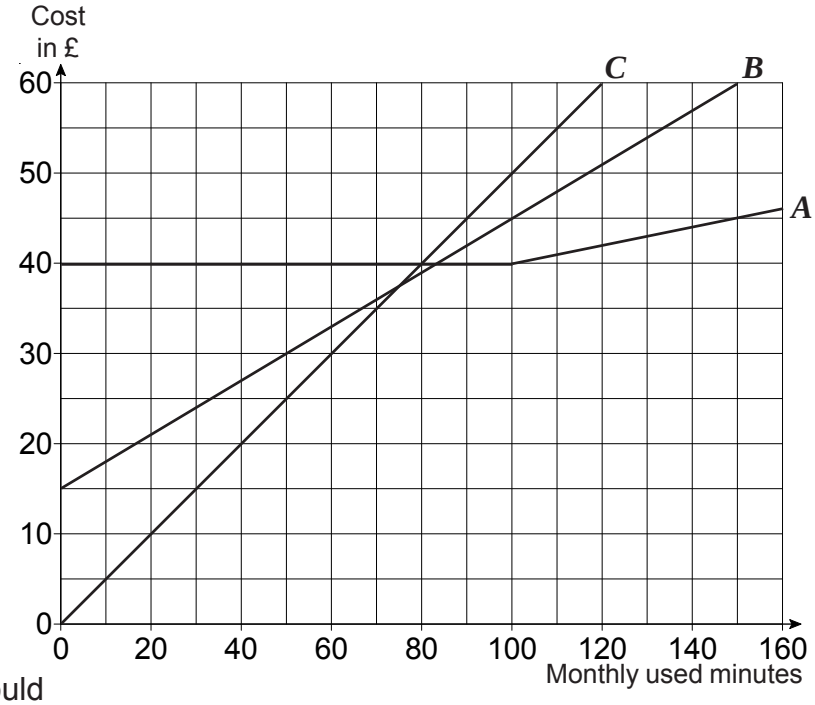


2) The graph below shows three different mobile phone tariffs.

Tariff 1
Pay as you go
50p per minute.

Tariff 2
£15 per month and
30p per minute

Tariff 3
£40 per month,
100 free minutes then
10p per minute



a) Match each tariff with its graph, A, B or C

b) Every month, James needs about 90 mins talk time.
Work out which tariff would be best for him. Explain your answer.

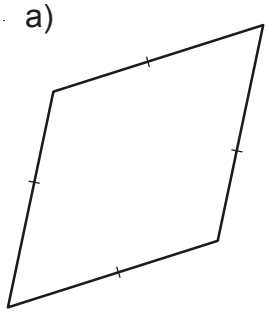
c) Tariff 4 is announced. This is £10 per month, 40 free minutes then 30p per minute.
Draw a line on the graph to show this tariff.

Level 6

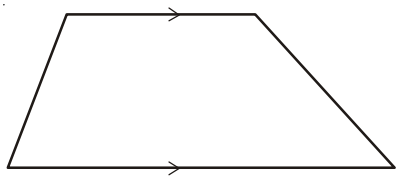
S17 Properties of Quadrilaterals

1) Write down the names of the quadrilaterals a) to g)

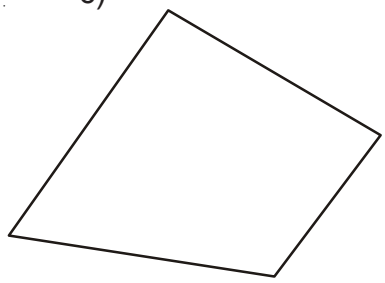
a)



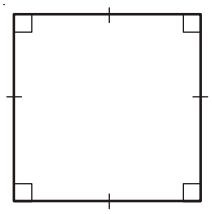
b)



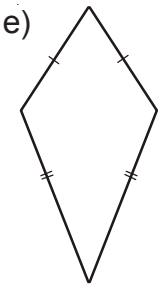
c)



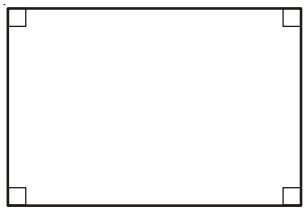
d)



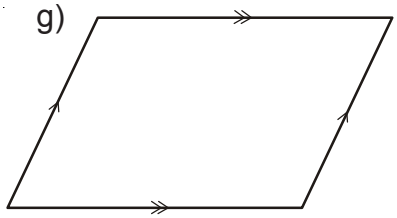
e)



f)

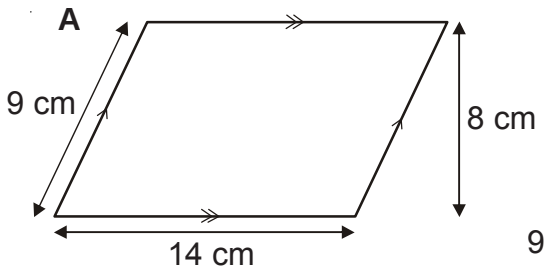


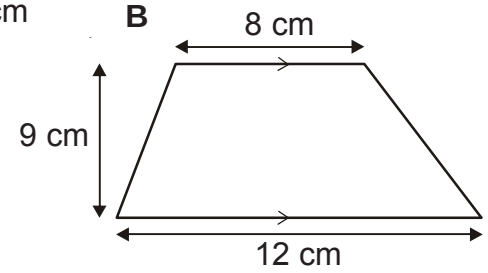
g)

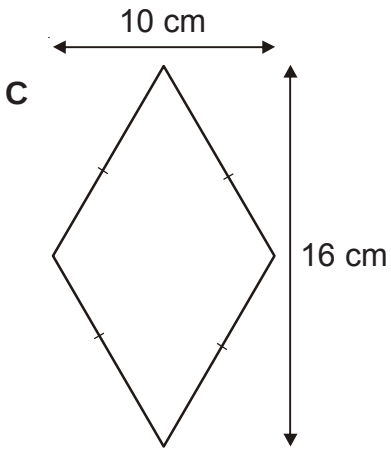


2) Fill in the table for quadrilaterals A, B and C.

Shape	*Number of lines of symmetry*	*Order of rotational symmetry*	*Area*
A			
B			
C			



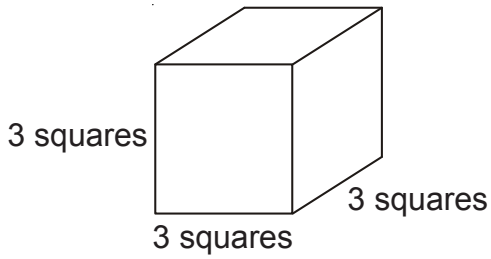




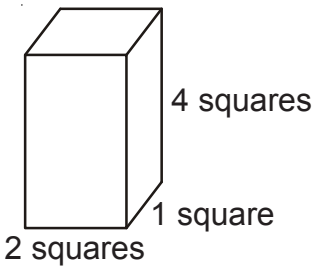
Level 6

S18 Nets of 3D Shapes

a) Draw a net of this cube.



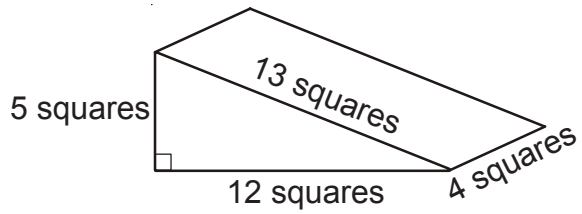
b) Draw a net of this cuboid.



Level 6

S18 Nets of 3D Shapes

Draw a net of this triangular prism.



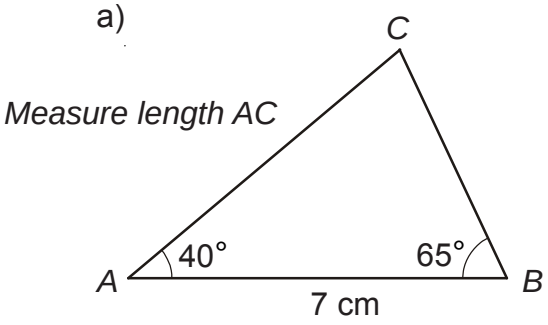
Level 6

N19 N20 N21 C22 C23 C24 C25 A7 A8 A9 A10 A11 A12 A13 A14 A15 S17 S18
S19 S20 S21 S22 S23 S24 S25 S26 S27 S28 S29 D8 D9 D10 D11 D12 D13

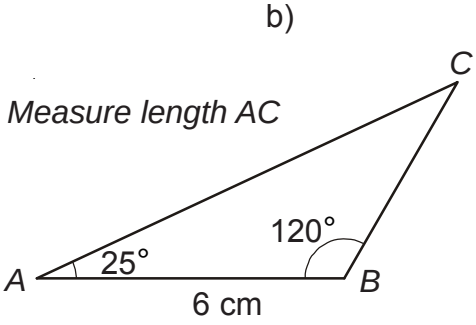
S19 Constructions

1) Using only a ruler, protractor and pencil, draw the following diagrams accurately.
For each diagram measure and write down the side you are asked for.

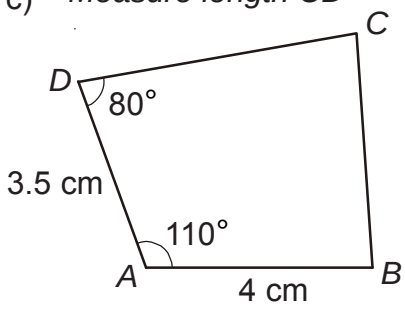
a)



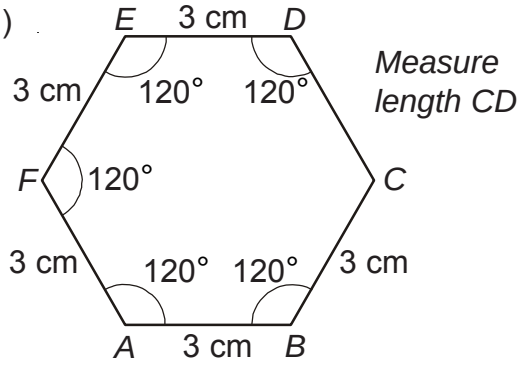
b)



c) Measure length CD

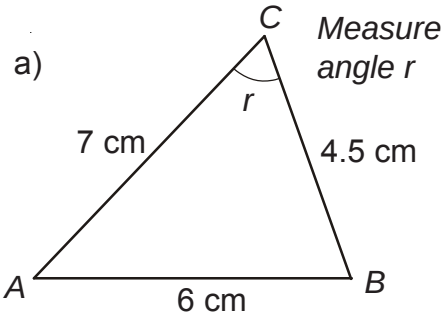


d)

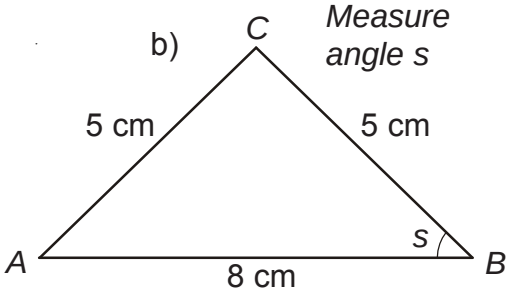


2) Using only a ruler, pencil, compasses and protractor as needed, draw the following diagrams accurately.
For each diagram, measure and write down the angle you are asked for.

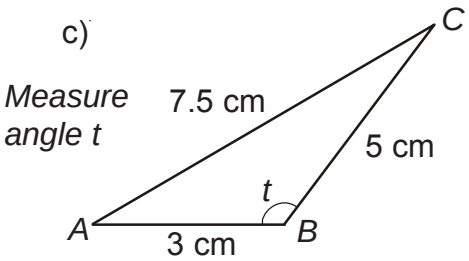
a)



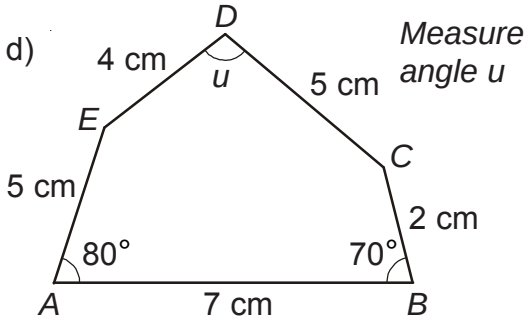
b)



c)



d)

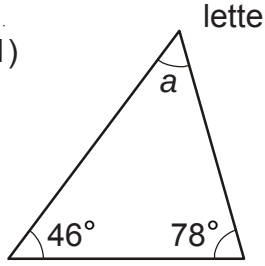


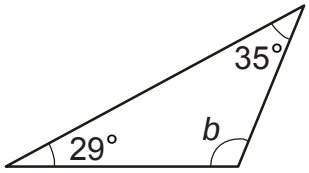
Level 6

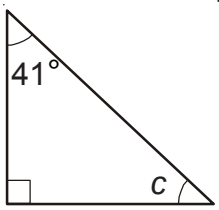
S20 Geometric Problems

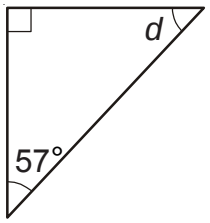
In every question below, calculate the missing angles indicated by the letters. None of the diagrams are drawn accurately.

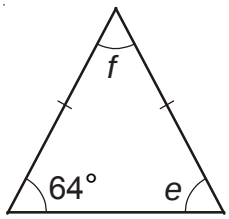
1)

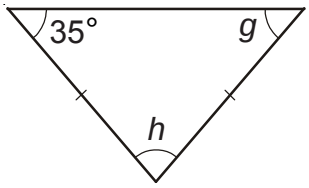


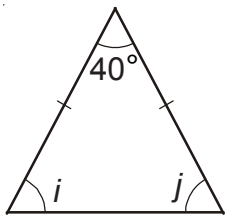


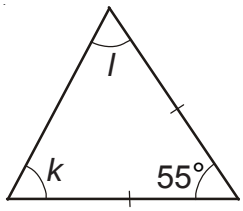




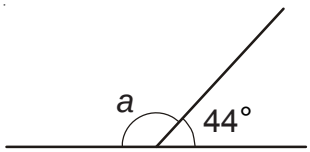


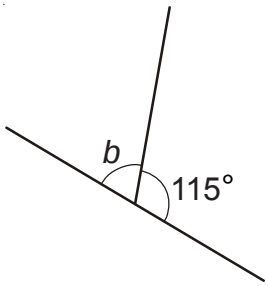


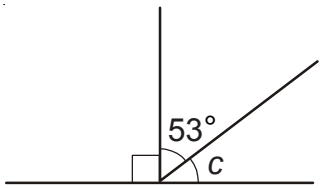


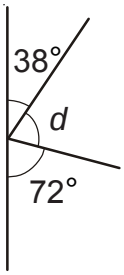


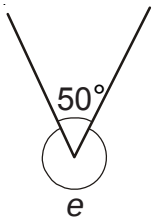
2)

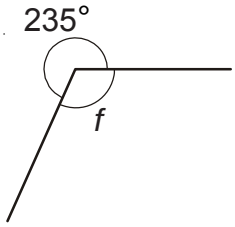


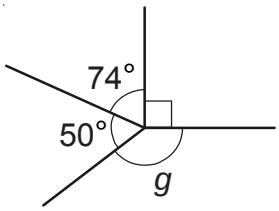


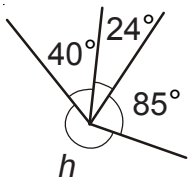




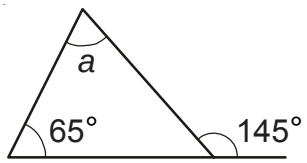


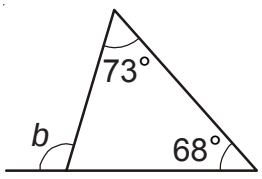


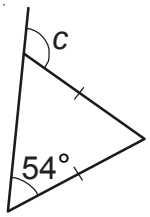


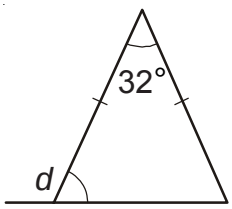


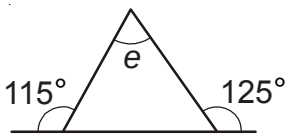
3)

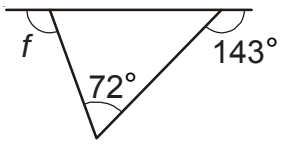


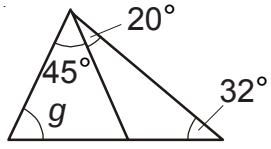


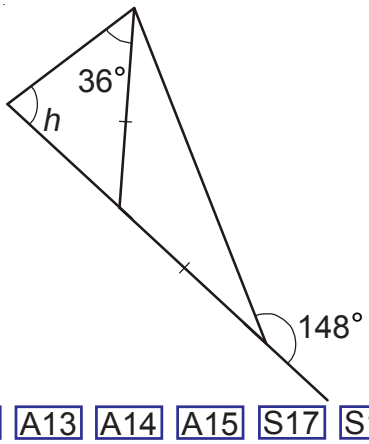










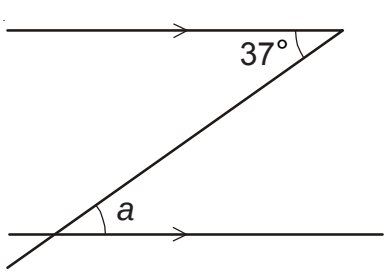


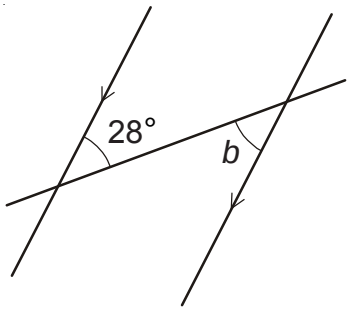
Level 6

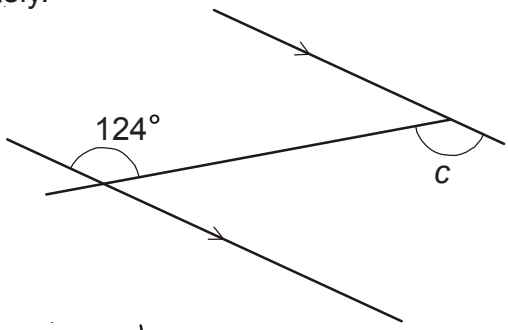
S21 Corresponding and Alternate Angles

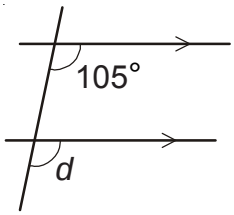
In every question below, calculate the missing angles indicated by the letters. None of the diagrams are drawn accurately.

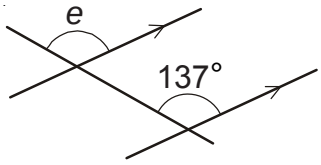
1)

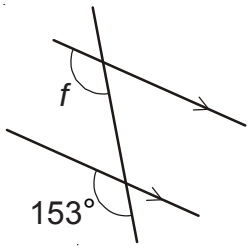




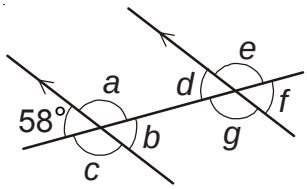


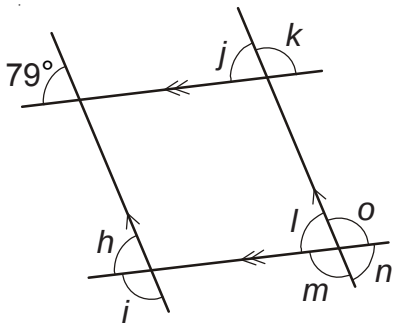


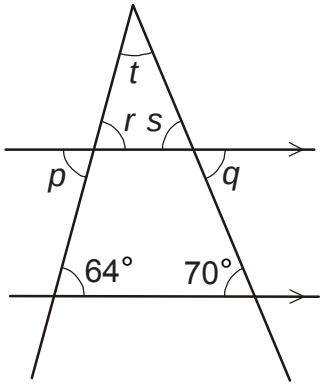




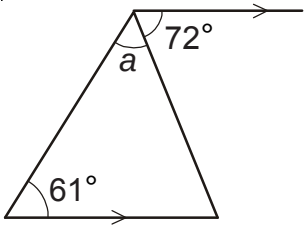
2)

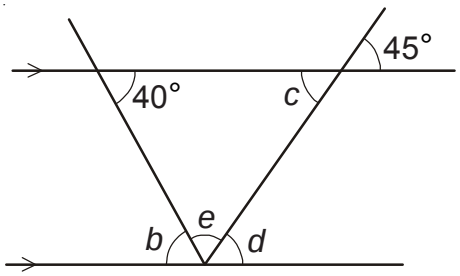




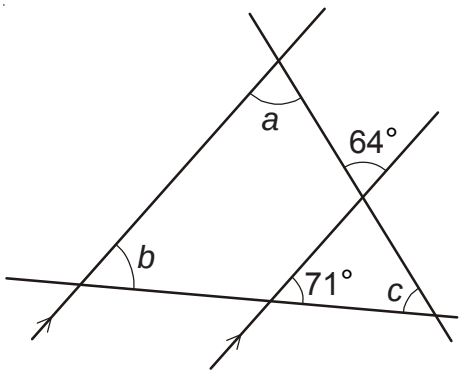


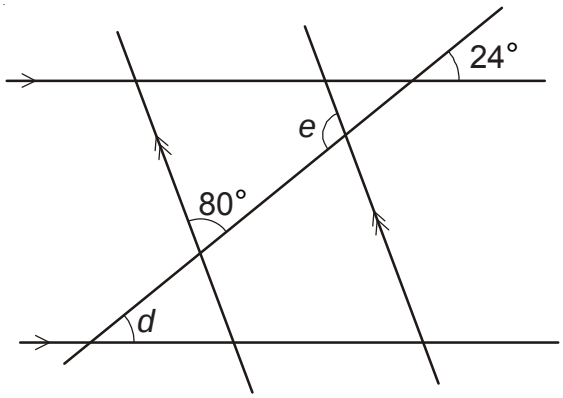
3)





4)



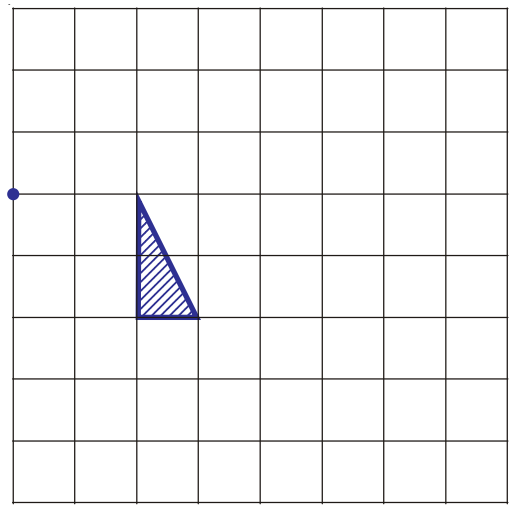


Level 6

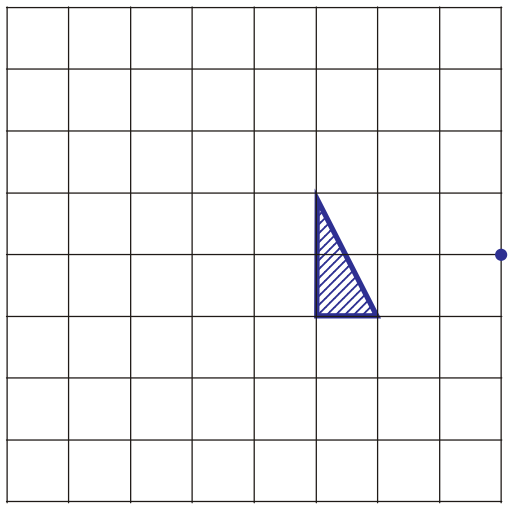
S22 Enlargement

Enlarge the following shapes with scale factor 2, using the dot as the centre of enlargement.

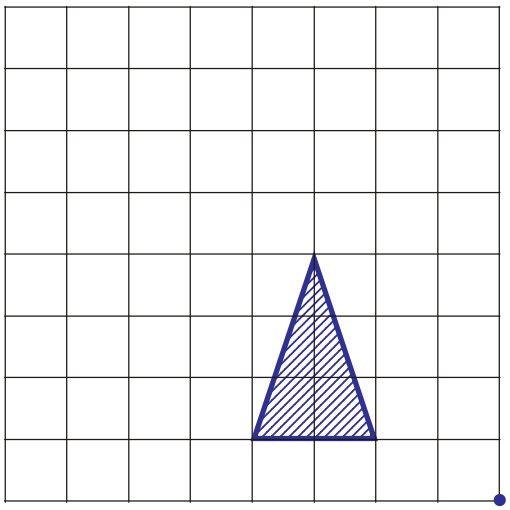
a)



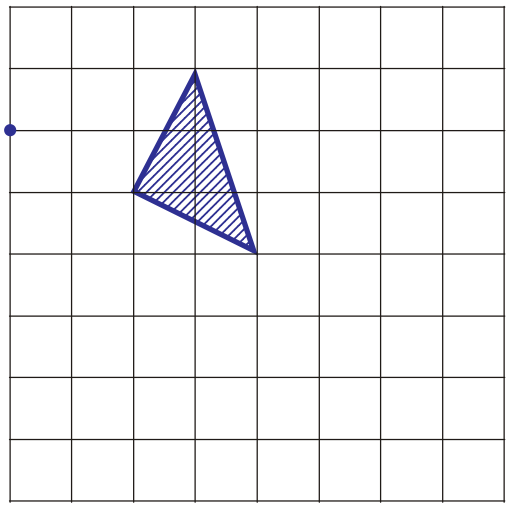
b)



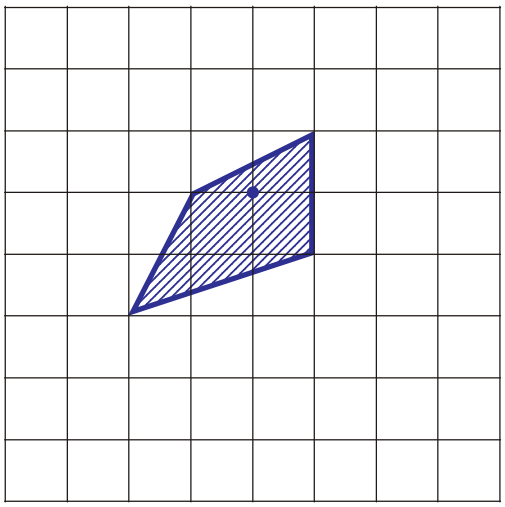
c)



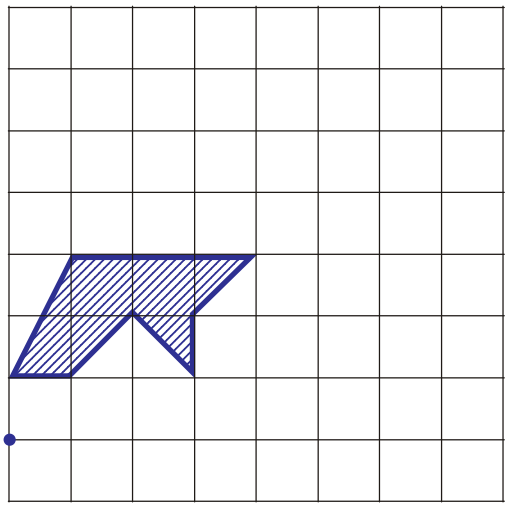
d)



e)



f)

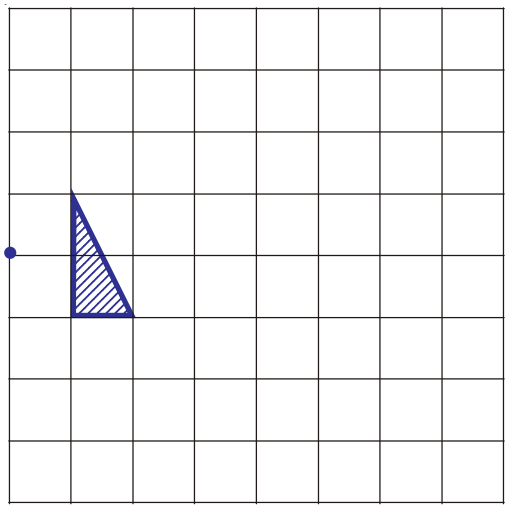


Level 6

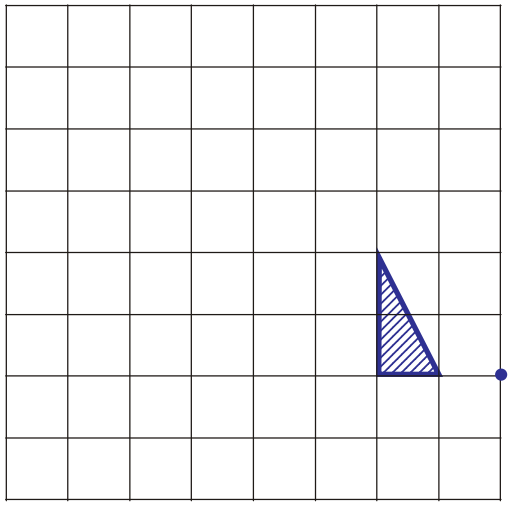
S22 Enlargement

1) Enlarge the following shapes using the dots as the centres of enlargement.

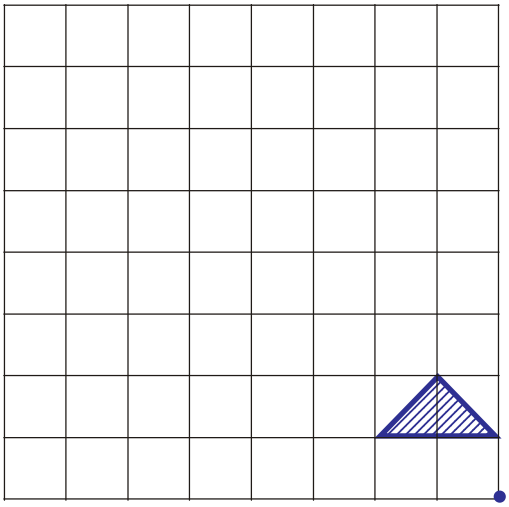
a) Scale factor 3



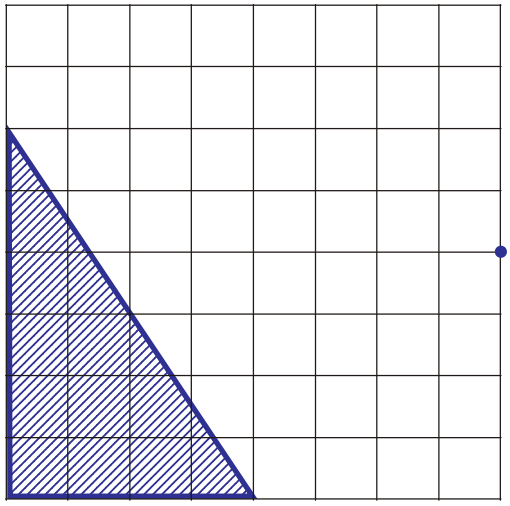
b) Scale factor 3



c) Scale factor 4

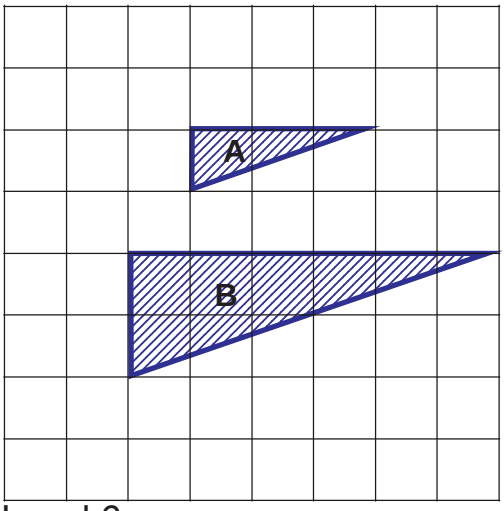


d) Scale factor 0.5

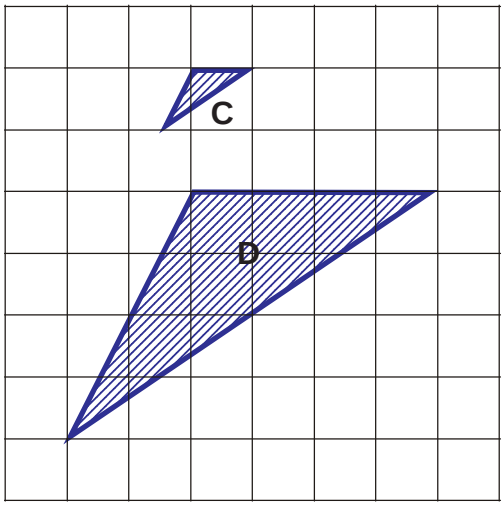


2) Use dots to mark on the grids the positions of the centres of enlargement.

a)



b)



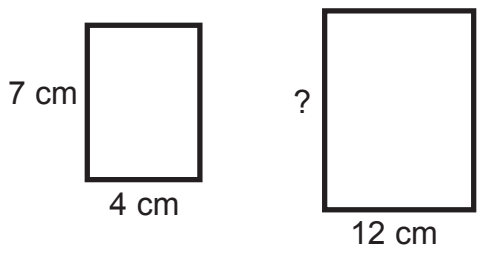
Level 6

S23 Similar Shapes

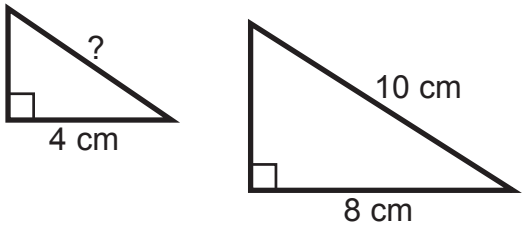
1) In each of the following questions, the two shapes are mathematically similar.

Work out the lengths of the missing sides.

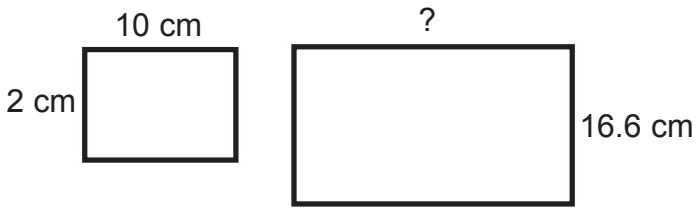
a)



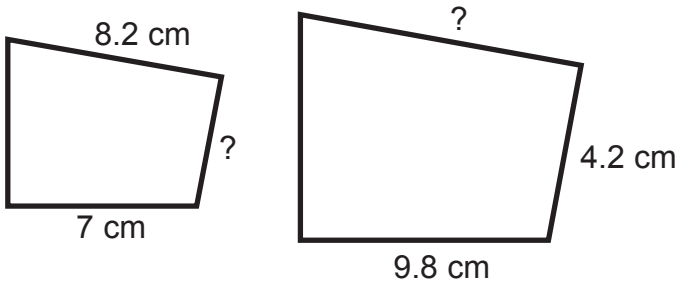
b)



c)

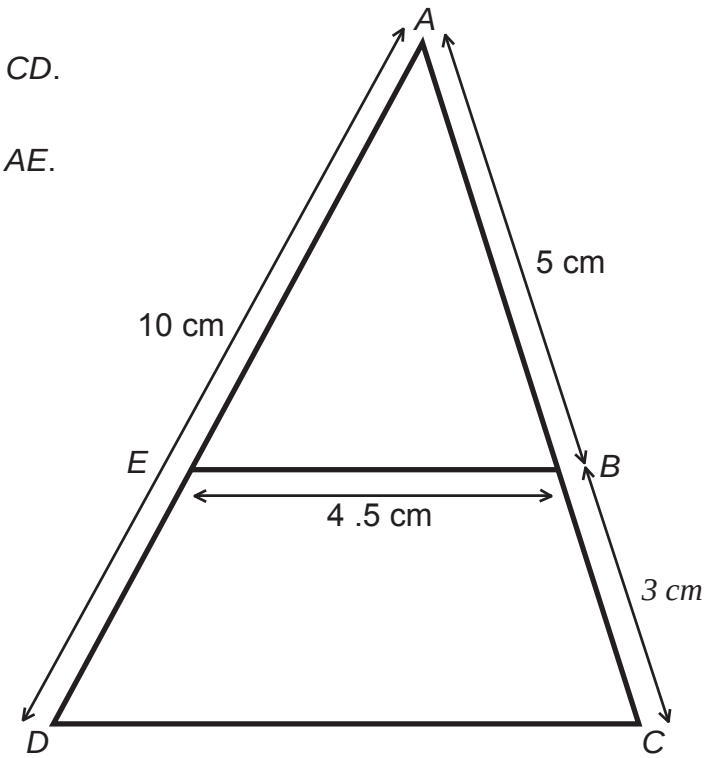


d)



2) a) Work out the length of *CD*.

b) Work out the length of *AE*.

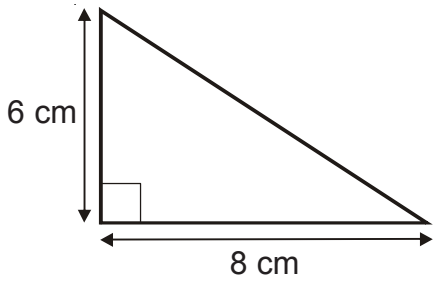


Level 6

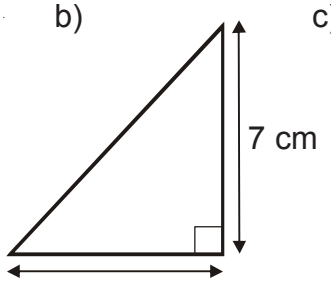
S24 Area of a Triangle

1) Find the areas of the following triangles

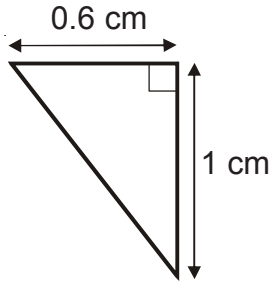
a)



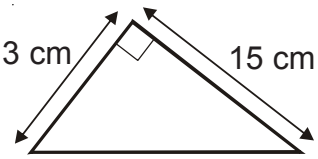
b)



c)

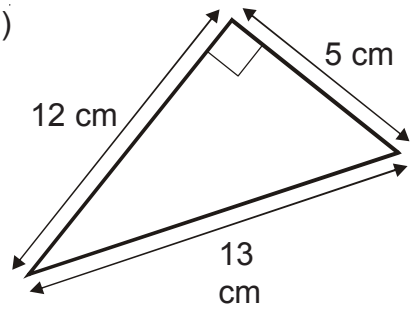


d)

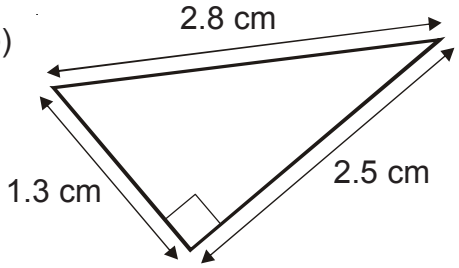


2) Find the areas of the following triangles

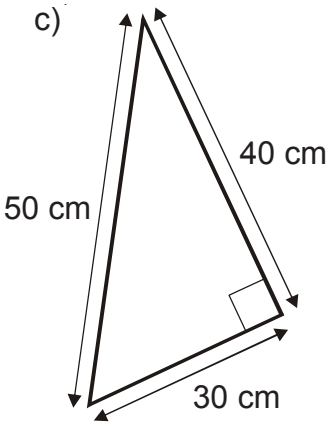
a)



b)

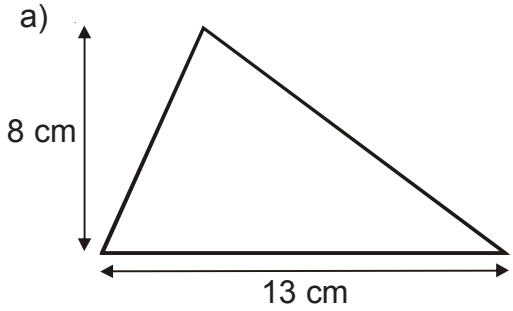


c)

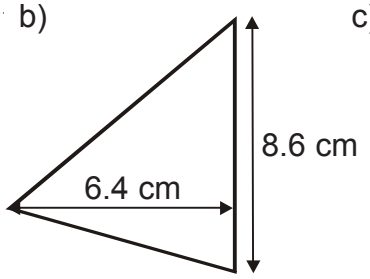


3) Find the areas of the following triangles

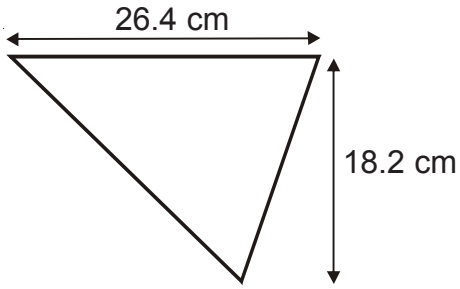
a)



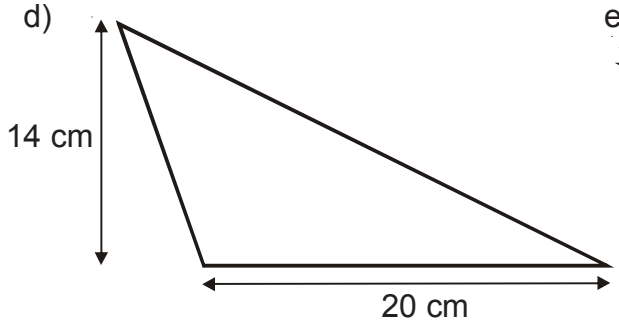
b)



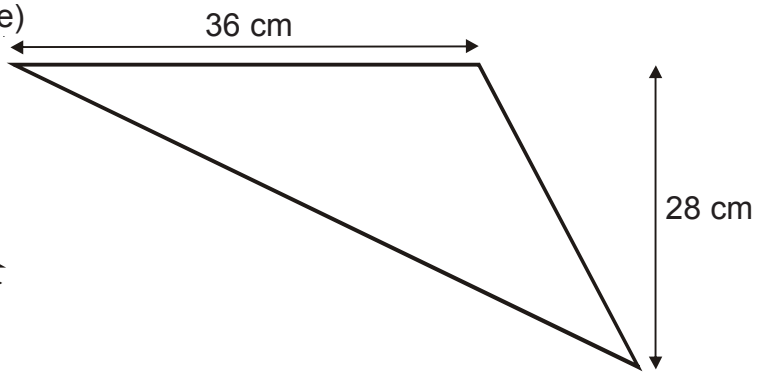
c)



d)



e)

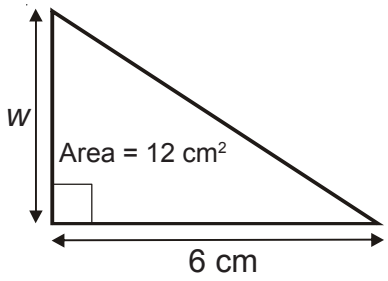


Level 6

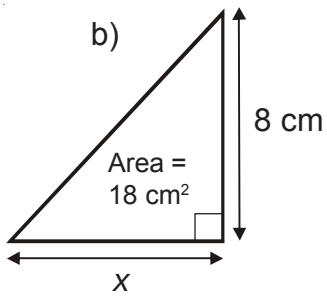
S24 Area of a Triangle

1) Find the lengths *w*, *x*, *y* and *z*

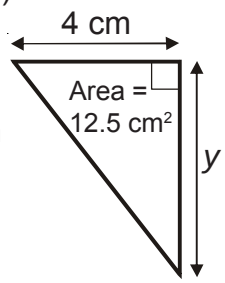
a)



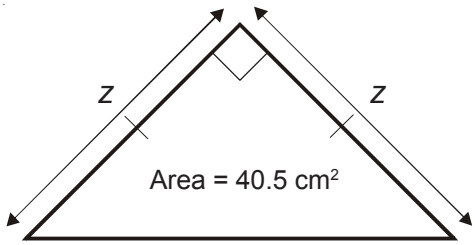
b)



c)

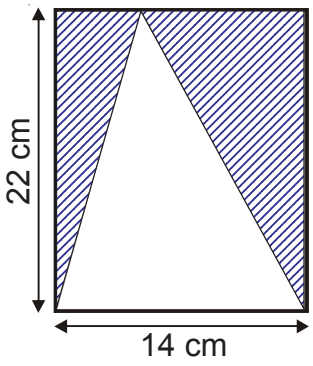


d)

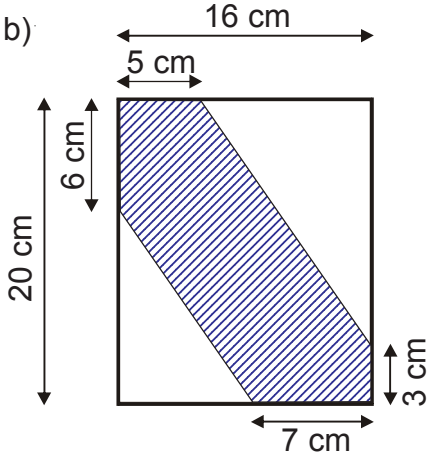


2) Find the areas of the following shaded parts of rectangles

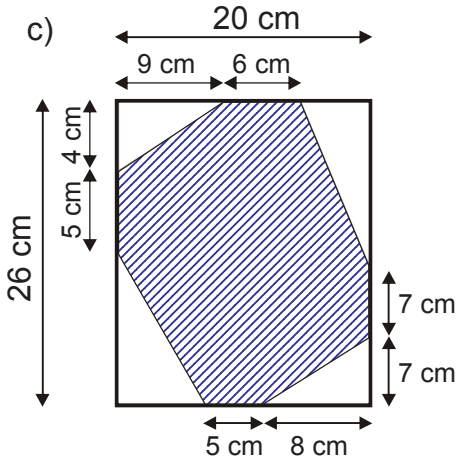
a)



b)

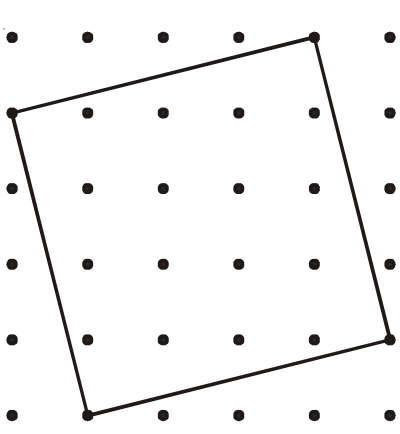


c)

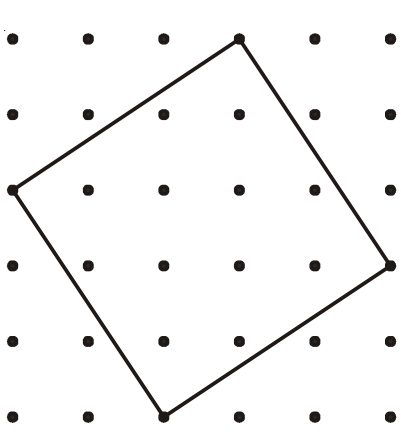


3) The two squares are drawn on 1 cm square grids.
Find the areas of the squares.

a)



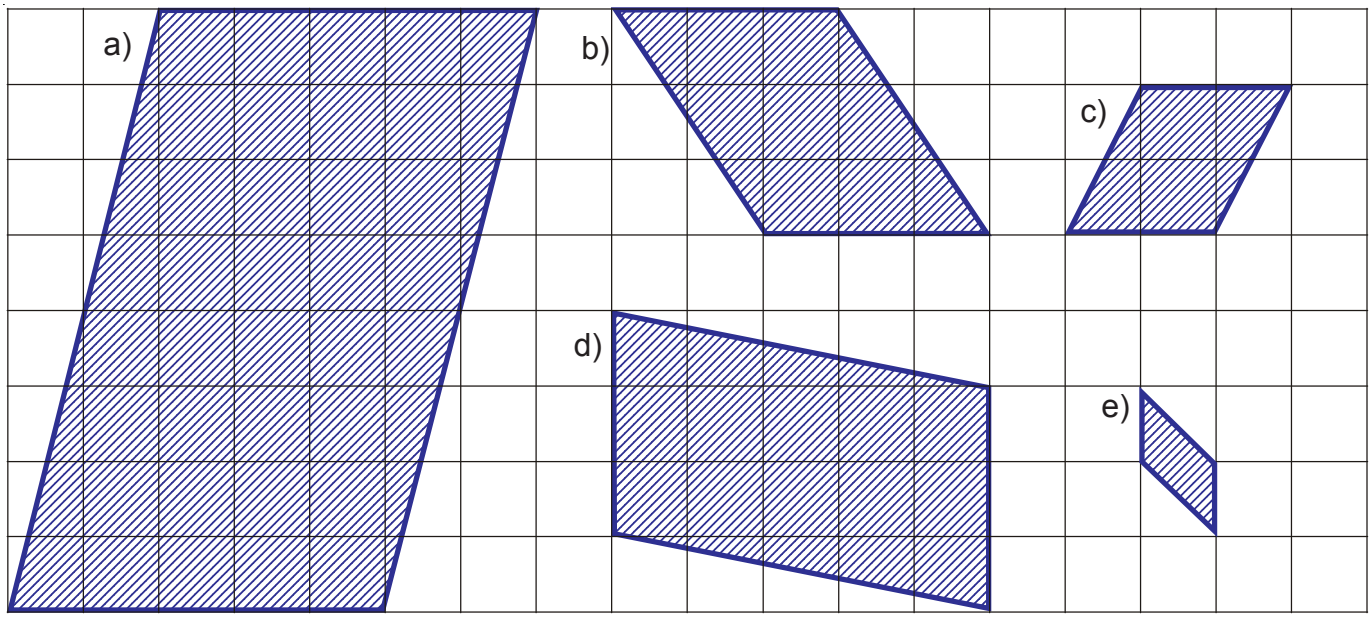
b)



Level 6

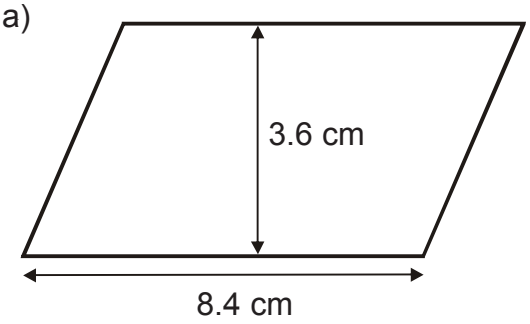
S25 Area of a Parallelogram

1) Find the areas of the five parallelograms on this cm square grid.

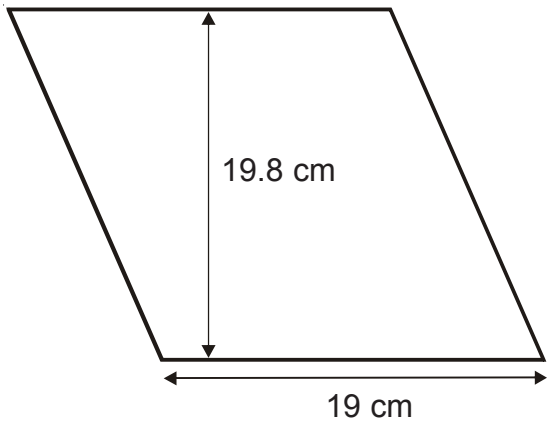


2) Find the areas of these four parallelograms

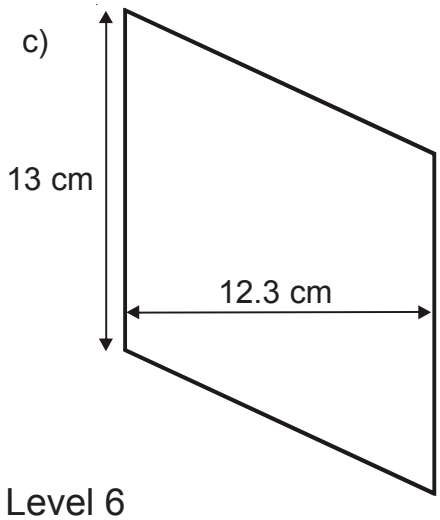
a)



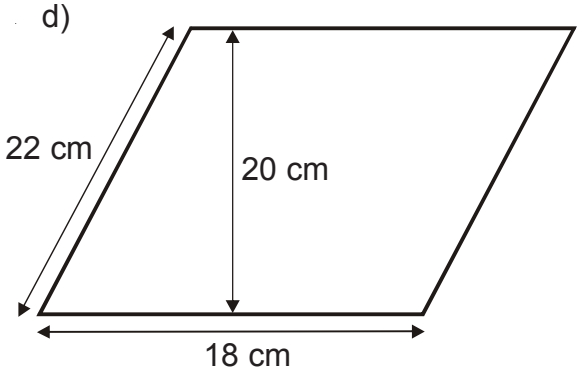
b)



c)



d)

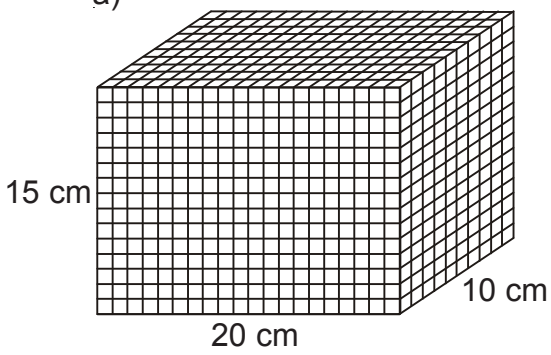


Level 6

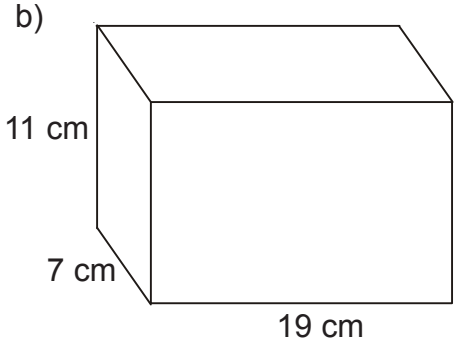
S26 Volume of a Cuboid

1) Find the volume of the following:

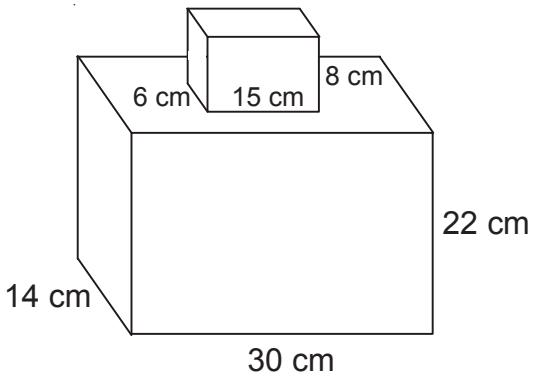
a)



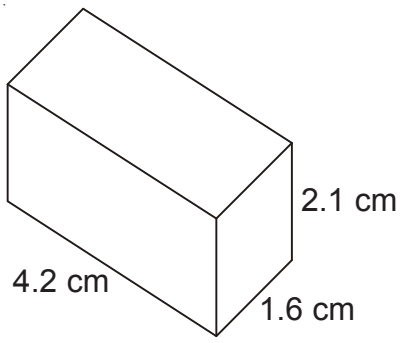
b)



c)

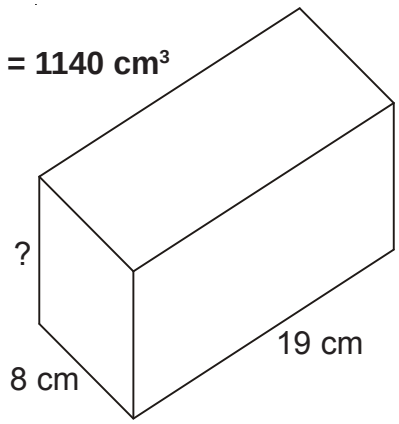


d)



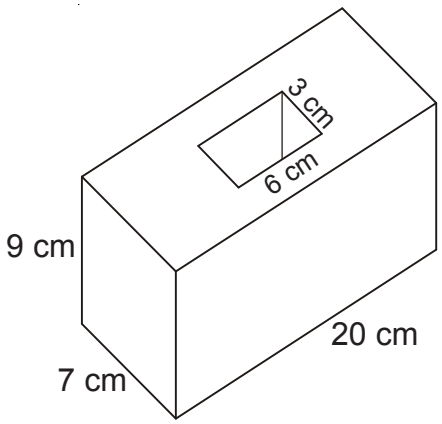
2) Find the height of this cuboid

Volume = 1140 cm^3



3) The cuboid below is made out of steel and has a rectangular hole all the way through it.

If 1 cm^3 of steel has a mass of 8 g, what is the mass of the cuboid?

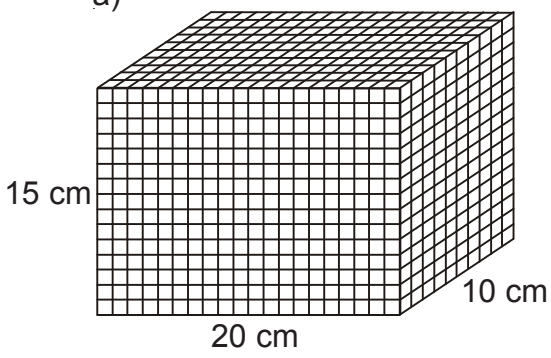


Level 6

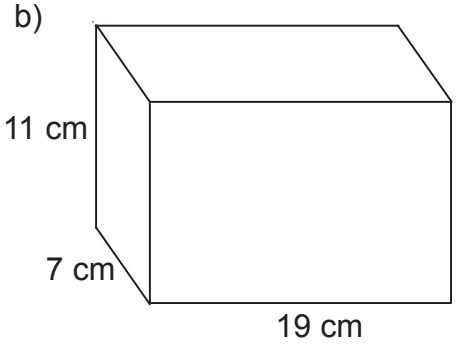
S27 Surface Area of a Cuboid

1) Find the surface area of the following:

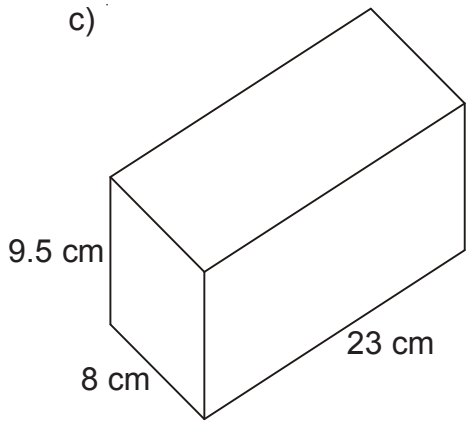
a)



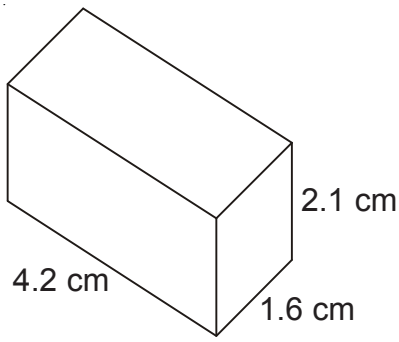
b)



c)



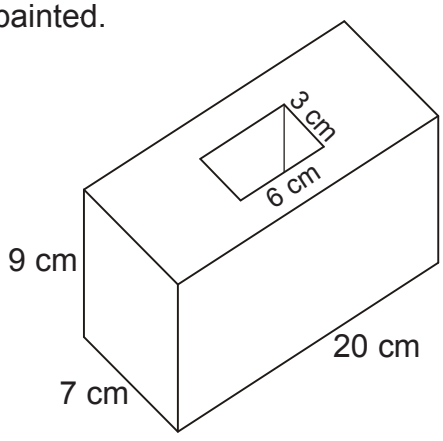
d)



2) The cuboid below is made out of steel and has a rectangular hole all the way through it.

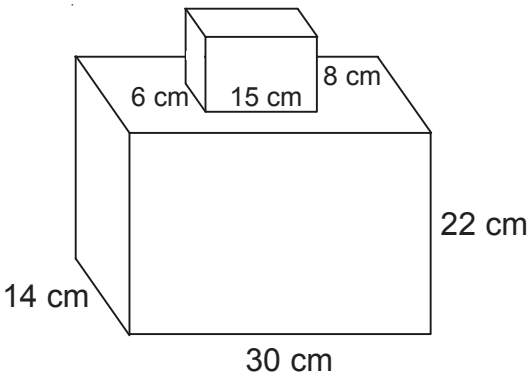
All the surfaces are painted including the base and the sides of the rectangular hole.

Work out the area which will be painted.



3) The shape below consists of a cuboid glued onto another cuboid.

If the whole shape - including the base - is painted, work out the area which will be painted.



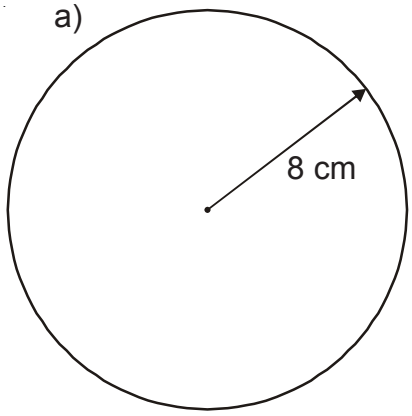
Level 6

S28 Circumference of a Circle

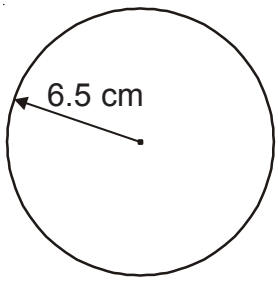
In all questions, take π to be 3.142

1) Find the circumference of the following circles

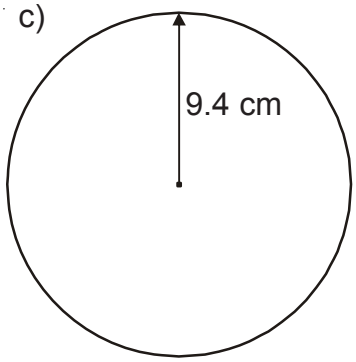
a)



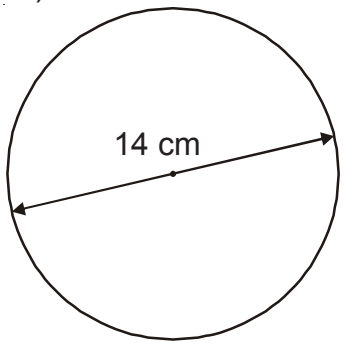
b)



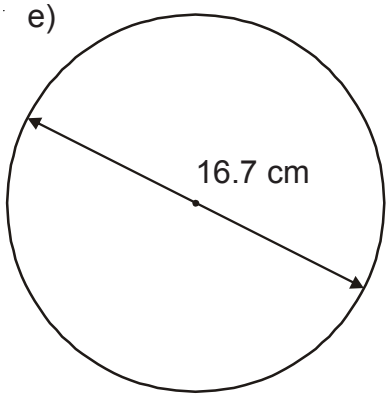
c)



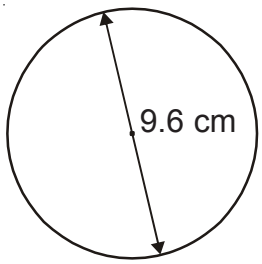
d)



e)

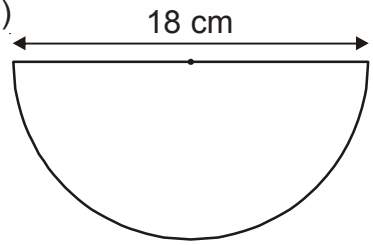


f)

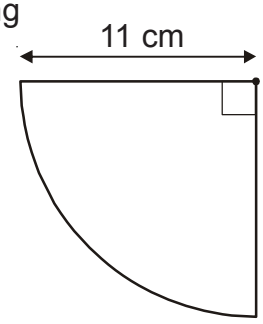


2) Find the perimeter of the following

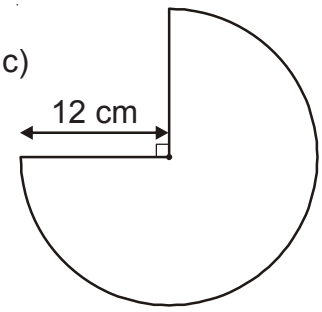
a)



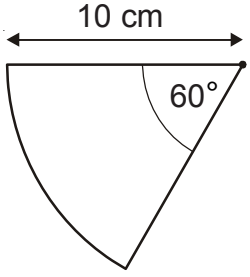
b)



c)



d)



3) The circumference of the earth is approximately 40000 km.

If you had a piece of string which was 6.3 m longer than 40000 km and put it around the earth, how far away from the earth, all the way round, would the extra 6.3 m allow it to be?

a) 0.1 mm b) 1 mm c) 1 cm d) 1 m

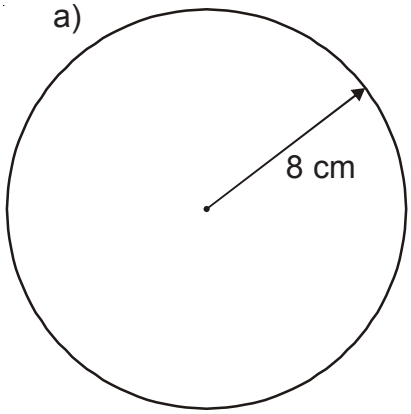
Level 6

S29 Area of a Circle

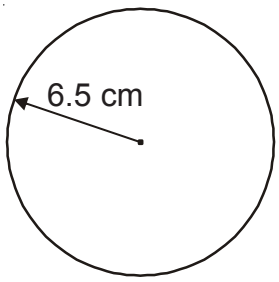
In all questions, take π to be 3.142

1) Find the areas of the following circles

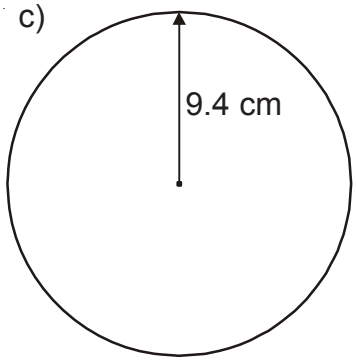
a)



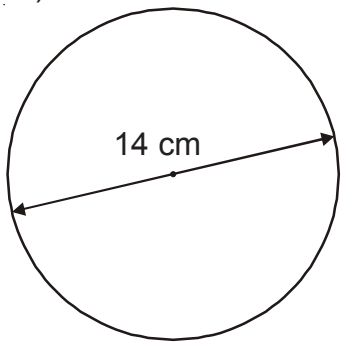
b)



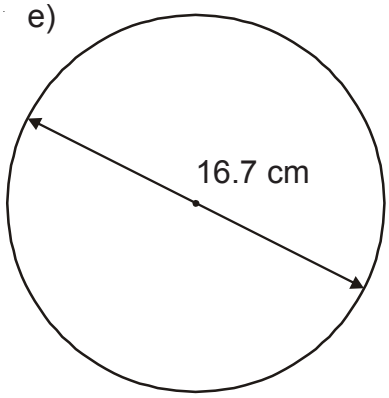
c)



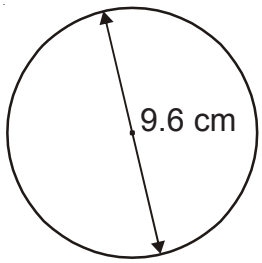
d)



e)

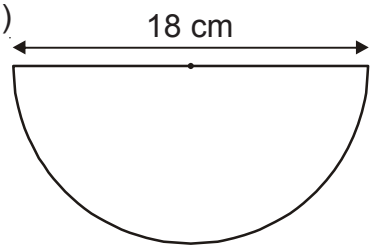


f)

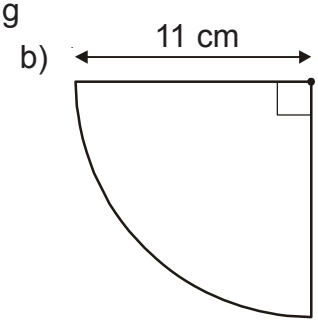


2) Find the areas of the following

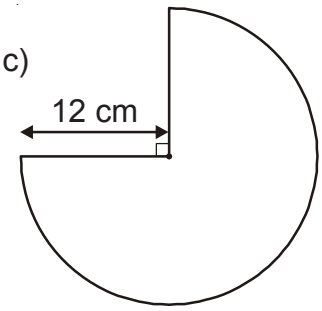
a)



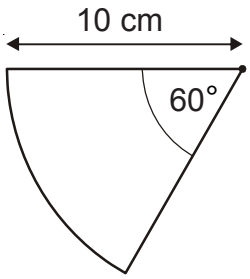
b)



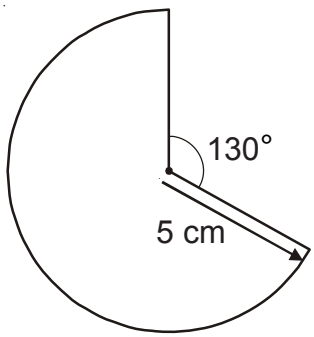
c)



d)



e)



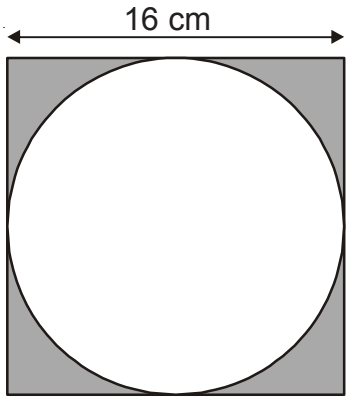
Level 6

S29 Area of a Circle

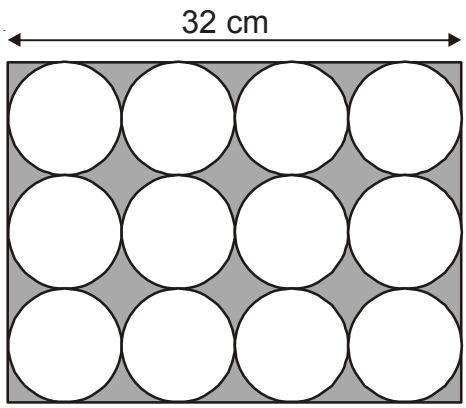
In all questions, take π to be 3.142

In each question, find the area of the shaded section.

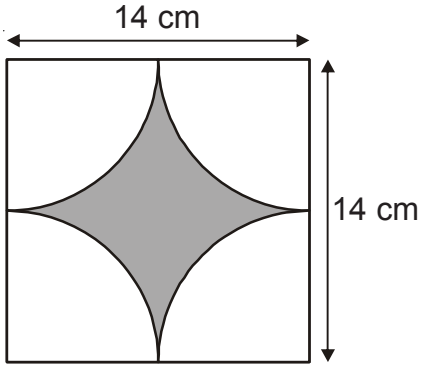
a)



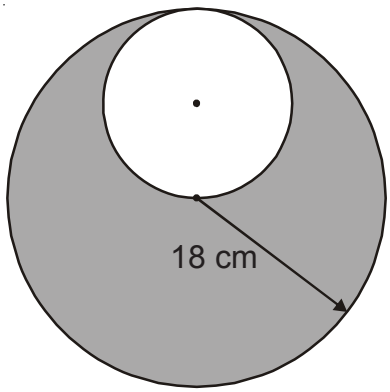
b)



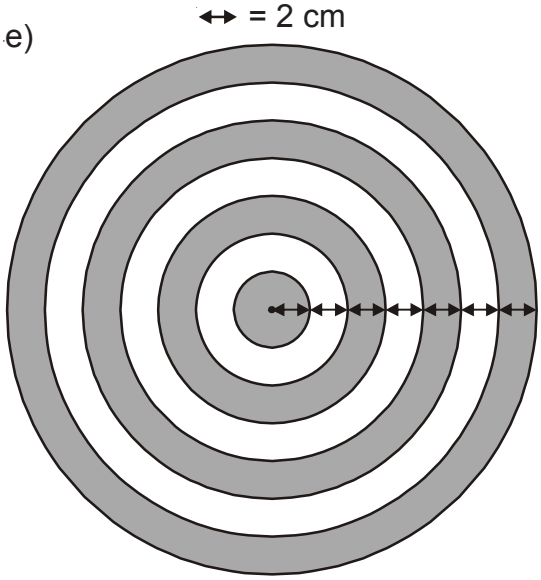
c)



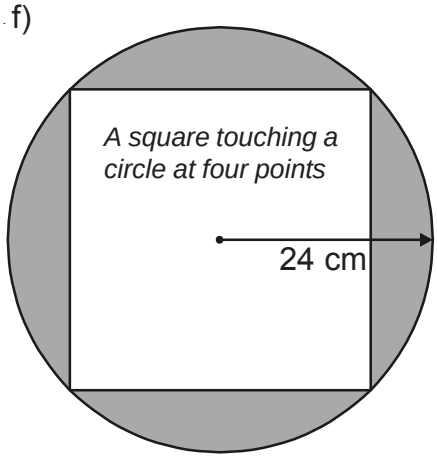
d)



e)



f)



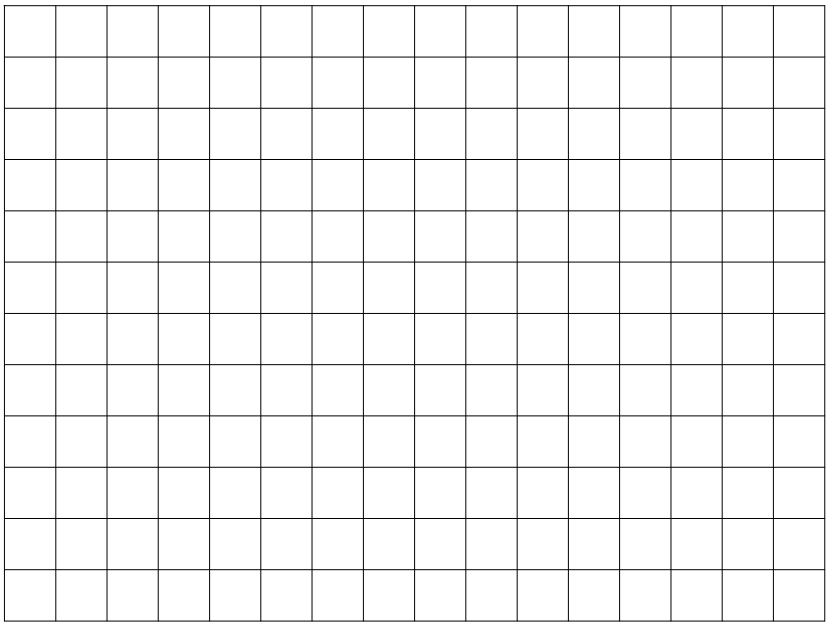
Level 6

D8 Bar Charts and Frequency Diagrams

1) A group of pupils were asked for their favourite colour. Here are the results.

Draw a suitable chart to show this information.

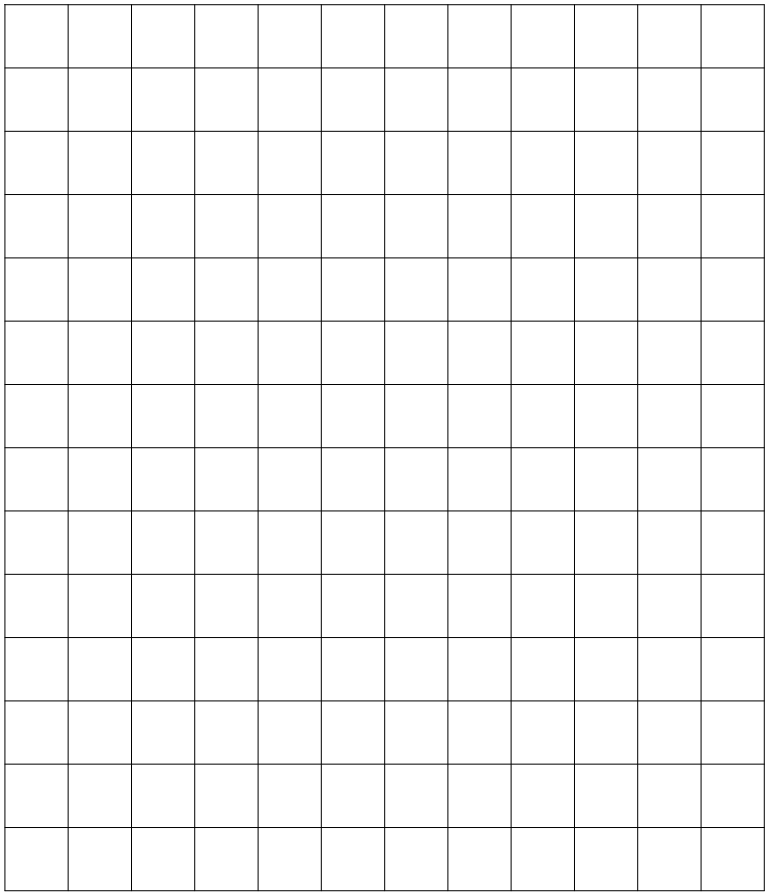
Colour	Frequency
Red	8
Blue	10
Purple	9
Green	4
Yellow	7



2) A group of people were given a puzzle to solve.
The time taken by each individual to complete the puzzle was recorded in the table below.

Draw a suitable chart to show this information.

Time in mins	Frequency
$0 \leqslant t < 10$	5
$10 \leqslant t < 20$	6
$20 \leqslant t < 30$	12
$30 \leqslant t < 40$	11
$40 \leqslant t < 50$	10

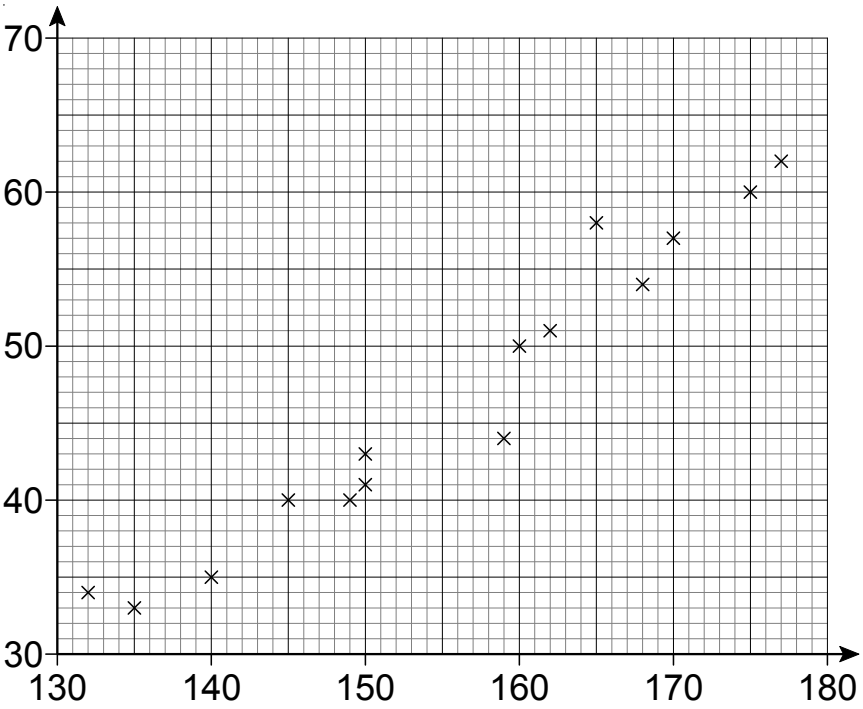


Level 6

D9 Scatter Graphs

1) The heights and weights of some children are shown in the table, below.

Height (cm)	132	145	150	140	175	168	177	162	170	162	165	149	150	135	159	160
Weight (kg)	34	40	43	35	60	54	62	51	57	51	58	40	41	33	44	50



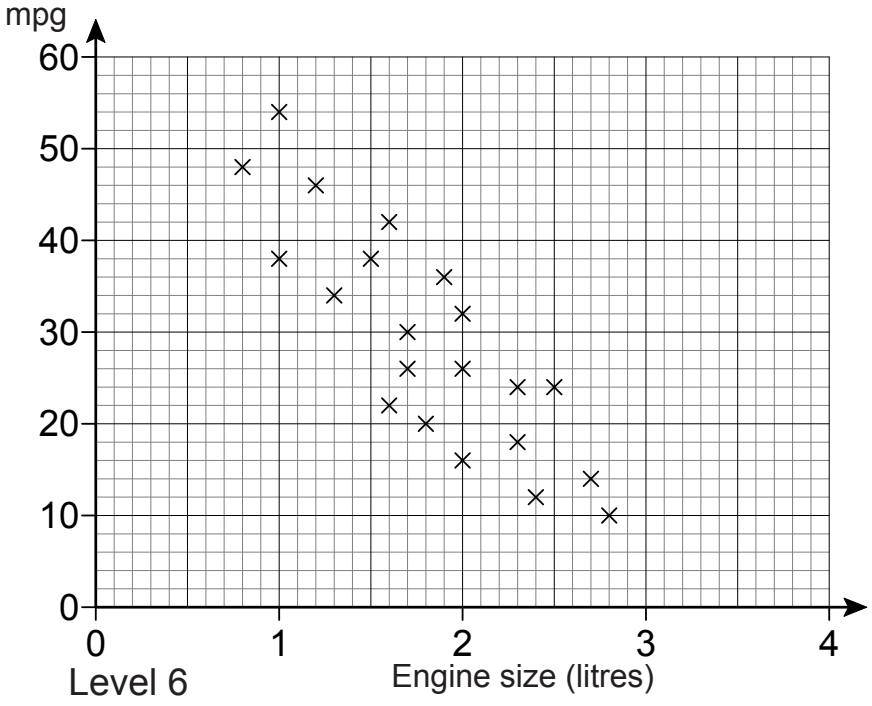
a) Plot the information from the table.

b) Describe the correlation between height and weight.

c) Draw a line of best fit.

d) Estimate the weight of a child of similar age to the group above with a height of 155 cm.

2) The scatter graph below relates car engine sizes to their fuel consumption in mpg.



a) Describe the correlation shown by the data.

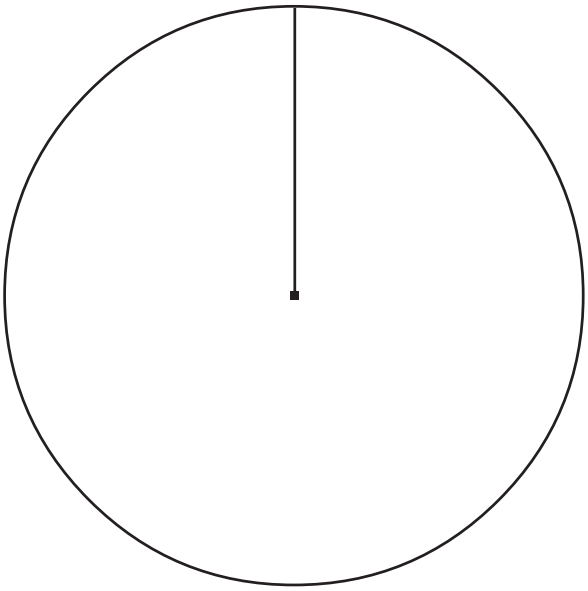
b) A car has an mpg of 25. Estimate the engine size.

Level 6

D10 Pie Charts

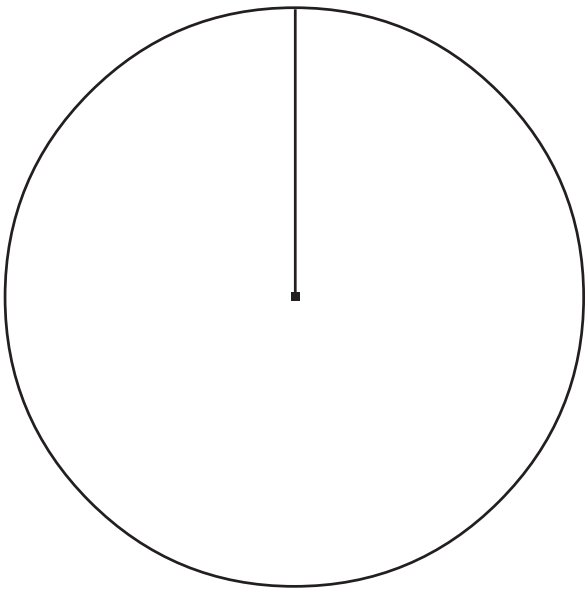
1) The table on the right shows how far 90 visitors to a museum have travelled.
Draw a pie chart to show this information.

Distance	Frequency
Within the city	13
Within 30 miles of the city	9
Over 30 miles from the city	20
Overseas	48



2) The table shows the land usage of a farm.
Draw a pie chart to show this information.

Land usage	Area (hectares)
Arable	80
Pasture	70
Woodland	50
Waste	40



Level 6

D11 Two-Way Tables

1) 160 pupils in a school are asked to choose a new colour for the school tie. They can only choose from Blue, Green or Red.
Some of the results are shown in this two-way table.

	Blue	Green	Red	Total
Male	30			85
Female			14	
Total	65		42	160

Complete the two-way table.

2) A survey was done by a school to find out how people travel to the school. Altogether, 100 people were asked and the results can be seen below.

	Walk	Car	Cycle	Taxi	Bus	Total
Male pupils	12	3	6	1		
Female pupils		1	5		6	20
Male teachers		12		6		32
Female teachers	4		2	7	2	23
Total	25		19	20	12	100

a) Complete the two-way table.

b) How many people cycle to school?

c) How many female pupils go to school by taxi?

Level 6

D12 Surveys

1) Lesley wants to find out the types of food people like best.
She is going to ask people to choose between Italian Food, French Food, Indian Food and Chinese Food.

Design a suitable table for a data collection sheet she could use to collect this information.

2) Beth wants to find out two things:
- the types of books people prefer to read
- how much time, on average, they spend reading books

a) Design two suitable questions for Beth to use in her questionnaire.

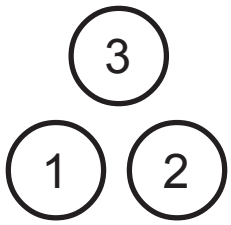
b) She decides to ask her questions to the first ten people going into the public library on a Saturday morning.

Give one reason why this might not be a good way to carry out the survey.

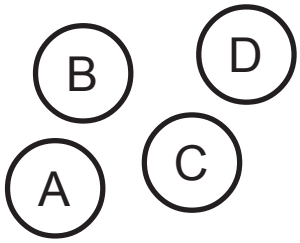
Level 6

D13 Further Probability

1) A counter is taken at random from set 1 followed by another counter at random from set 2.



Set 1



Set 2

a) Write down all the possible pairs of counters that may be chosen.

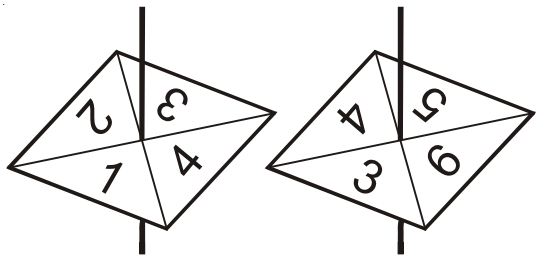
b) What is the probability that 3B will be picked?

c) What is the probability that any pair of counters will be chosen **except** 3B?

d) What is the probability that the pair of counters chosen will include an odd number?

2) The two spinners on the right are spun and their scores added together to give a total.

a) Draw a possibility space to show all the totals.



b) What is the probability of scoring a total which is bigger than 5?

3) Every Tuesday the main school dinner is either Sausages, Chicken, Pizza or Tuna.

Use the table below to work out the probability that the main dinner will be Pizza next Tuesday.

School dinner	Sausages	Chicken	Pizza	Tuna
Probability	0.24	0.18	?	0.47

Level 6