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S3 General Homework 1 - General Calculator

SHOW ALL WORKING REQUIRED TO ANSWER EACH QUESTION

1 State the number of significant figures in each number:

a) 23 489 b) 610 c) 5600000

d).0.805 e) 2.970 f) 0.0053

2 Round each of the following numbers to 2 decimal places:

a) 0.598 b) 7.2384 c) 22.364

d) 108.009 e) 0.007 f) 109.321

3 Write the following numbers in scientific notation.

$a \times 10^n$ where $1 < a \leq 10$ and n is an integer

a) 37 b) 460 c) 120000

d) 0.845 e) 0.00045 f) 5.78

4 Use your calculator to find the value of:

a) $\sqrt{(13^2 - 5^2)}$ b) $\sqrt{(25^2 - 24^2)}$

c) $5\frac{3}{4} + 3\frac{4}{7}$ d) $6\frac{2}{5} - 4\frac{5}{13}$

e) $2\frac{3}{11} \times 5\frac{7}{12}$ f) $12\frac{3}{5} \div 11\frac{5}{9}$

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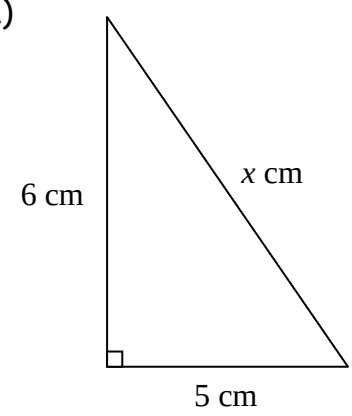
S3 General Homework 2 – Pythagoras 1 Hypotenuse

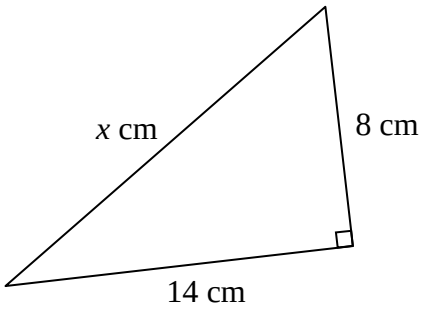
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 For each of the right-angled triangle below,
calculate the length of side marked x cm, correct to 1 decimal place.

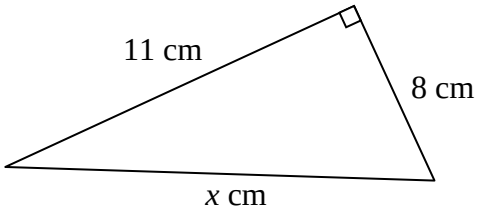
(a)



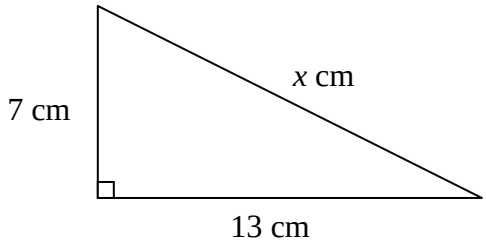
(b)



(c)



(d)



2 Write the following numbers in standard form:

a) 6 000

b) 560

c) 123 000

d) 0.007

e) 0.483

f) 9.65

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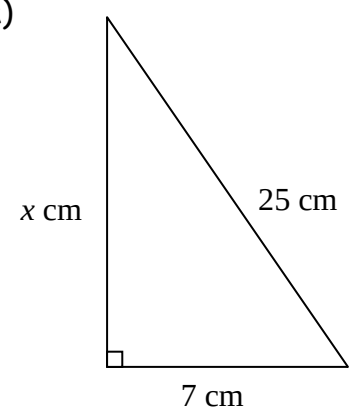
S3 General Homework 3 – Pythagoras Not Hypotenuse

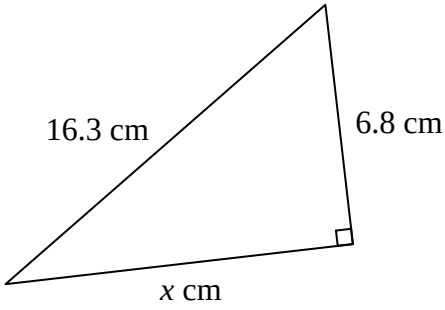
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 For each of the right-angled triangle below,
calculate the length of side marked x cm, correct to 1 decimal place.

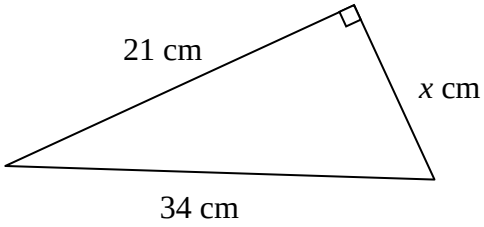
(a)



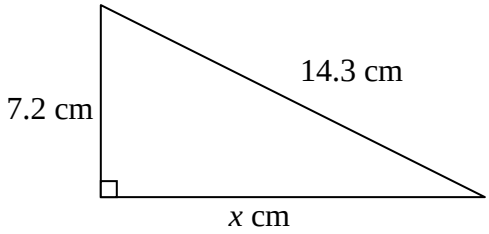
(b)



(c)



(d)



2 Evaluate:

a) $3+4\times7$

b) $5-42\div7$

c) $4+3(7+2)$

d) $32-5(7-4)$

e) $3+4\times5-2$

f) $40\div5+3\times6$

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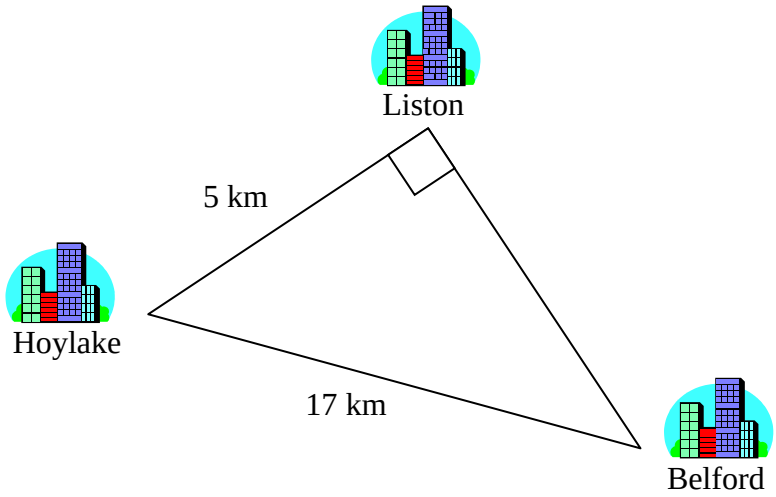
S3 General Homework 4 – Pythagoras Problem Solving

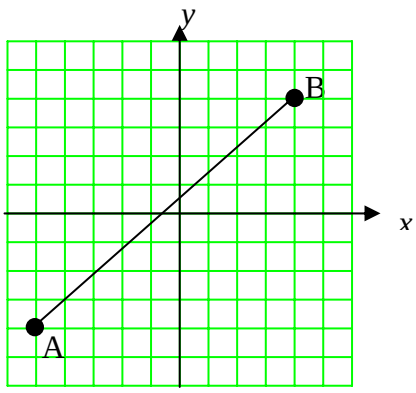
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 The diagram below shows the position of three towns, Belford, Hoylake and Liston.



Calculate the distance from Liston to Belford correct to 1 decimal place.

2



Copy the diagram and write down the coordinates of the points A and B.

Calculate the length of AB

3 Mary has a ladder 6 metres long.
Mary places the ladder against a wall.
The ladder is 1.2 metres from the wall.
How far up the wall will the ladder reach, to the nearest centimetre

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S3 General Homework 5 – Removing Brackets

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Remove the brackets

a) $4(x+9)$ b) $6(5+a)$

2 Remove the brackets

a) $5(2w+3)$ b) $2(4x+3)$

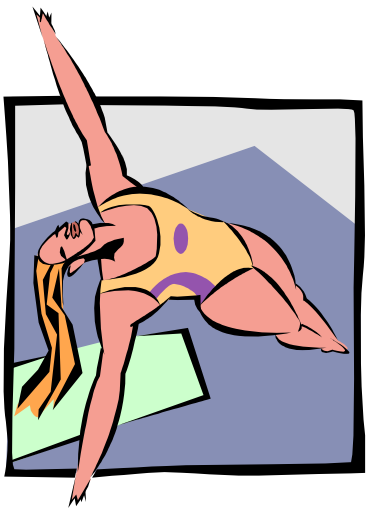
3 Remove the brackets

a) $x(x+5)$ b) $y(y+4)$

4 Solve the equations

a) $2x-1=9$ b) $2y+1=y+5$

5 To calculate each competitor's score in a diving competition the three judges' scores are added and the 'degree of difficulty' number for the dive then multiplies the sum.



a) Jane is awarded 5,5.5 and 5.6 for a dive with degree of difficulty of 1.4.
Find her final score?

b) Sean has a sore of 6, 6.5 and 5.5 for a dive with degree of difficulty 1.8.
Find his final score.

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S3 General Homework 6 – Further Brackets

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Remove the brackets

a) $4(3y-2)$ b) $6(a+b)$

2 Remove the brackets and simplify

a) $5(x+2)+4$ b) $3(y+3)-y$

3 Remove the brackets and simplify

a) $5+2(b+4)$ b) $7+4(y-1)$

4 Solve the equations

a) $2(x+3)=24$ b) $9(y+7)=72$

5 *The Music Show* 7.20pm – 750pm.
Races and Racers 8.30pm – 10.15pm
Megan wants to record these programmes on a 3-hour tape

a) What 24-hour times should she use?

b) How much recording time is left on the tape?

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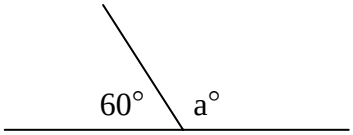
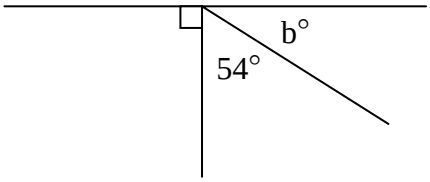
S3 General Homework 7 - Angles

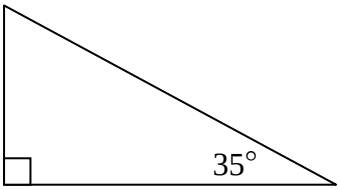
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

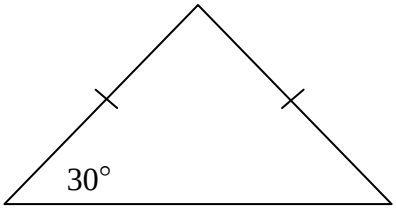
1 Copy each diagram and calculate the size of the following angles indicated by each letter.



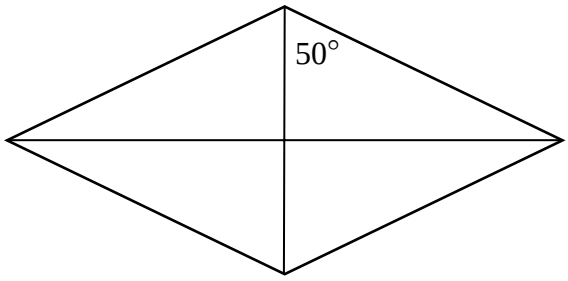


2 Copy each triangle and fill in the size of **all** angles.



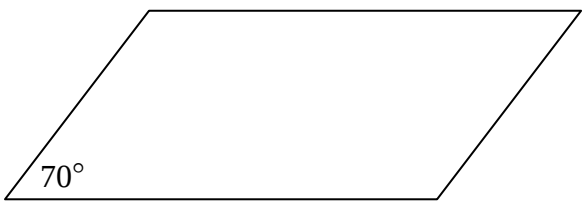


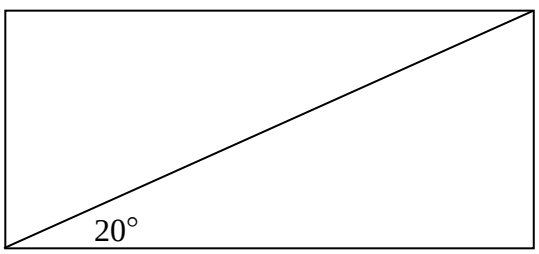
3 Copy each quadrilateral and fill in the size of **all** angles.



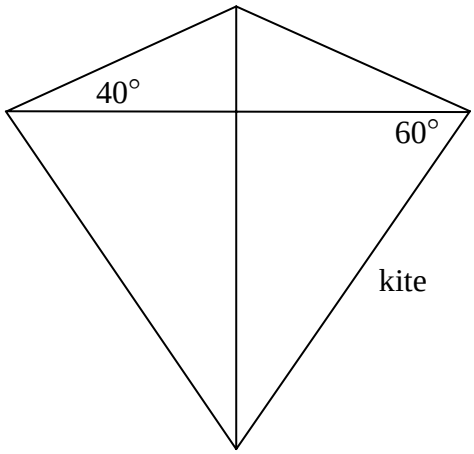
rhombus

parallelogram





rectangle



kite

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S3 General Homework 8 – Polygon Area

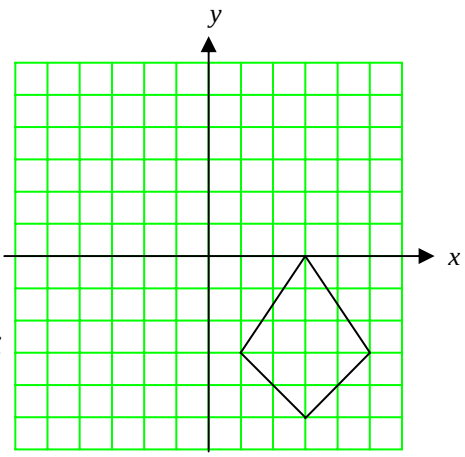
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Copy the diagram.

a) Write down the coordinates of each vertex

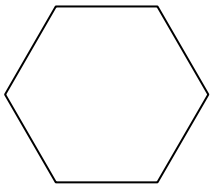
b) Draw the reflection of the kite in the *x*-axis.

c) Write down the coordinates of each new vertex

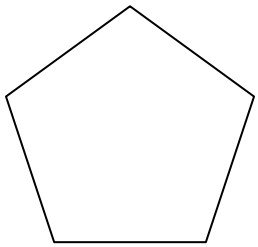


2 Calculate the size of each internal angle for the following regular polygons.

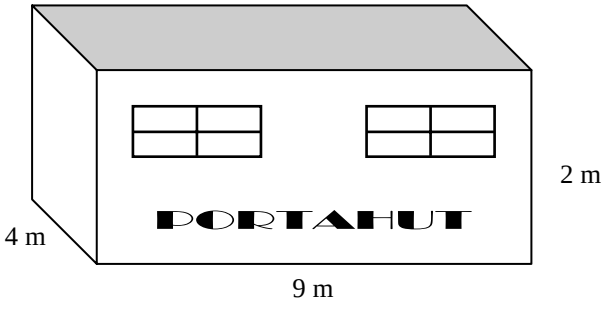
a)



b)



3 A *Portahut* cabin is in the form of a cuboid with no base.
It has a length of 9 metres a breadth of 4 metres and a height of 2 metres.
By calculating the area of each side of the hut, find the total surface area of the hut



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S3 General Homework 9 – Money

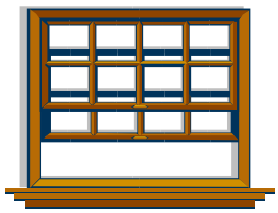
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Jack works as a secretary and earns £6.20 an hour.

(a) One week he works for 35 hours.
How much did he earn that week?

(b) Jack can earn extra pay by working overtime.
The overtime rate is time and a half.
How much extra can he earn if he works 5 hours overtime?

2 Ashley is a double-glazing salesperson.
She is paid 6% commission on all her sales.



One week Ashley sold windows worth £14 000.
Calculate how much commission she earned that week

3 The Dixon family decides to invest money in the East End Bank.

Dad, Darren, invests £2 000.
Mum, Marion, invests £6 000.
Son, Ian, invests £500.
Daughter, Emma, invests £350.

Calculate the amount of interest each member of the family will earn after one year.

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S3 General Homework 10 – VAT Bills

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Calculate the cost of the chair.

£350 PLUS
VAT AT 17.5%

2 Calculate each part of the following plumbers bill. Show all working

JOE PIPER PLUMBER	
3 metres of plastic piping at £7.50 per metre	
4 hours of labour at £16.40 per hour	
Sub Total	
+VAT at 17.5%	
TOTAL	

3 Calculate the value of the entries **A**, **B**, **C**, **D** and **E** for the electricity bill. Show all working for each calculation.

SCOTLAND ELECTRICITY			
Meter Reading		Charges	Amount(£)
Present	Previous		
19223	18101	**A** units at 8.55p	B
		STANDING CHARGE	8.50
		SUB TOTAL	C
		VAT AT 17.5%	D
17 Sept	- 11 Nov	TOTAL DUE	E

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S3 General Homework 11 – Hire Purchase

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 A Digital Camera can be bought for cash or by paying a deposit and 12 monthly payments.

£382 CASH
or £30 DEPOSIT
+12 MONTHLY
PAYMENTS OF
£35

Paul chooses to buy the camera using the second option.

a) Calculate the cost of all 12 monthly payments
b) Calculate the total cost of the camera by this method
c) How much more is the cost if you choose this method of payment?

2 RU Electric offer the following terms for buying a computer by instalments.

DEPOSIT 10% OF CASH PRICE PLUS
24 MONTHLY PAYMENTS OF £48

If the cash price of the computer is £1200
Calculate:
a) the deposit;
b) the total cost of paying by installment;
c) the amount saved by paying cash.

3 Hayley chooses to buy the car using the following option:

15% DEPOSIT
60 PAYMENTS OF £420

If the cash price of the car is £29 000
Calculate how much she will pay.

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S3 General Homework 12 – Time

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Here is part of a television schedule for an afternoon.

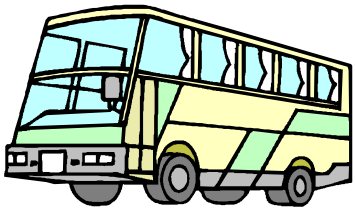
1.35 Brainteaser 3729524
2.05 High School Reunion (R) 7374747
3.10 Five News 3538456
3.25 FILM: Columbo Any Old Port in a Storm Drama 6384531
5.10 Play Away 6436472
5.35 Friends 5258621

a) How long does the programme Brainteaser last for?

b) How long does the programme Play Away last for?

c) Peter has 3 hour video cassette.
What start and finish times must he enter to record:
(i) High School Reunion;
(ii) The Film?
How much time will be left on the tape after recording these two programmes?

2. Darren and Kelly went on a bus journey.
They left at 9.00am and arrived at 1.25pm.
The bus travelled at an average speed of 90 kilometres per hour.



Calculate :

(i) how long the journey lasted;

(ii) the distance travelled.

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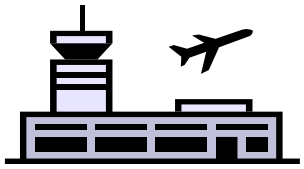
S3 General Homework 13 – DST

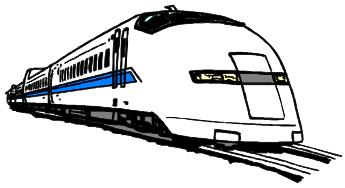
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 William flies to Belfast from Liverpool, a journey of 360 kilometres, at an average speed of 288 kilometres per hour.



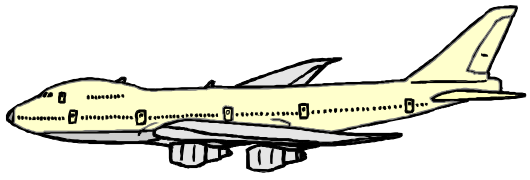
The plane took off from Liverpool's John Lennon Airport at 12 30, when did it touch down in Belfast?

2 Mary and Jane catch a train at 9.10 am.
They arrive at their destination at 11.40 am.
The trained travelled a total of 248 kilometres.



Calculate the average speed of the train.

3 A flight left Glasgow Airport at 07 30 and arrived in Valencia at 09 54.
The average speed of the plane was 720 kilometres per hour.



Calculate the distance between Glasgow and Valencia.

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S3 General Homework 14 – Handling Information

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Seven babies were weighed at the Baby Clinic. Their weights in kilograms were

5.5 7 8 6 7.5 6 9

Calculate:

(a) the range of weights.
(b) the mean and median weights.
(c) What was the modal weight?

2 Peter grows flowers for a competition
He records the height of each flower in centimetres.

50 60 50 60 20 70 90 50 70 90 50 60

Calculate:

(a) the range
(b) the mode
(c) the median
(d) the mean height of the flowers.

3 Copy and complete the frequency table

Length (mm)	Frequency	Length × frequency
68	3	
69	4	
70	2	
71	2	
72	8	
73	1	
Total		

Calculate the mean, median and modal lengths

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S3 General Homework 15 – Frequency Tables

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Copy and complete the frequency table:

Weight (gm)	Frequency	Weight × frequency
50	8	
60	6	
70	4	
80	2	
Total		

Calculate the mean weight.
Calculate the modal weight.

2 Copy and complete the frequency table:

Price (£)	Frequency	Price × frequency
50	50	
60	30	
70	20	
Total		

Calculate the mean price.
Calculate the modal price.

3 Copy and complete the frequency table:

Length (cm)	Mid-value	Frequency	Length × frequency
20 - 24		8	
25 - 29		6	
30 - 34		4	
35 - 39		2	
	Total		

Calculate the mean length

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S3 General Homework 16 – General Formulae

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Electrical engineers use the formula $E = IR$.

Calculate E where a) I = 2 and R = 5

b) I = 1.5 and R = 16

c) I = 17 and R = 48

2 The cost of hiring a taxi is £1 plus £2 per mile

We ca write this as a formula $A = 2B + 1$.

Calculate A where a) B = 24

b) B = 47

c) B = 257

3 Entry to club is £2 for members and £3 for non-members.

The total fee for a party is given by the formula $f = 2m + 3n$

Where m is the number of members

n is the number of non-members

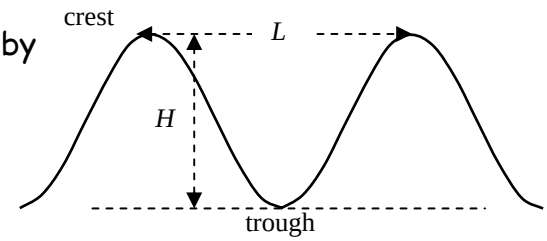
f is the fee in pounds.

Calculate f where a) m = 10 and n = 6

b) m = 36 and n = 24

c) m =1 9 and n = 15

4 The steepness, S, of an ocean wave is given by the formula $S = \frac{H}{L}$



Calculate S where a) H = 5m and L = 250m

b) H = 3.5m and L = 210m

c) H = 2.25m and L = 184.5m

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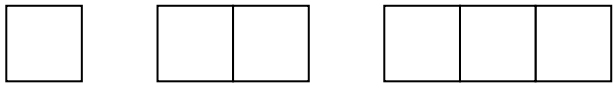
S3 General Homework 17 – Sequences

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

Engineers are costing the different shapes for a new bridge

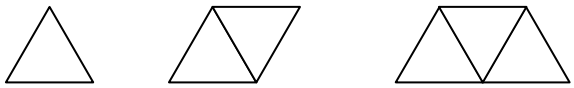
1 a) Copy and complete the table for this square shapes.



Number of squares (s)	1	2	3	4	5
Number of girders (*G*)	4	7			

b) Find a formula for *G* in terms of *s*.

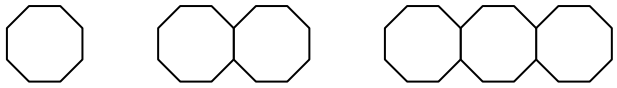
2 a) Copy and complete the table for this triangle shapes.



Number of triangles (*t*)	1	2	3	4	5
Number of girders (*G*)	3	5			

b) Find a formula for *G* in terms of *t*.

3 a) Copy and complete the table for this octagon shape.



Number of octagons (h)	1	2	3	4	5
Number of girders (*G*)	8	15			

b) Find a formula for *G* in terms of *h*.

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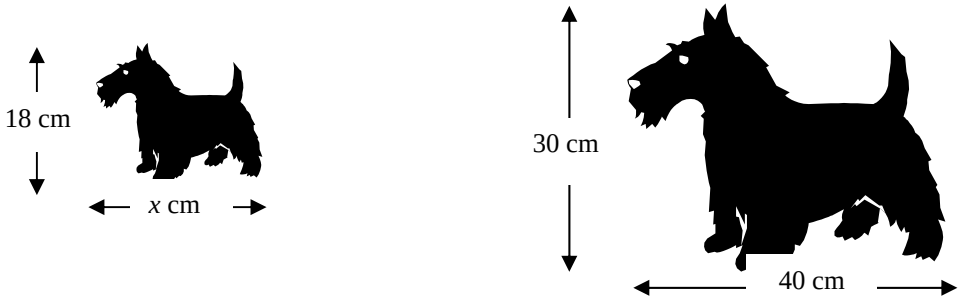
S3 General Homework 18 – Similar Shapes

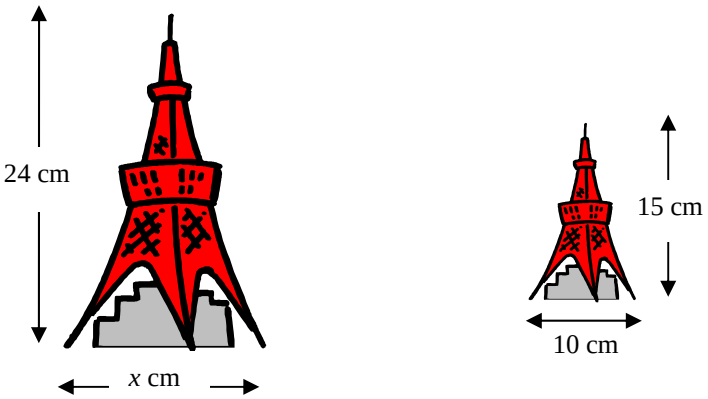
SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 A ceramic company makes two similar ornaments for Scottie Dogs, the Eiffel Tower and the Parthenon. For each two similar ornaments, calculate the scale factor and the value of x.

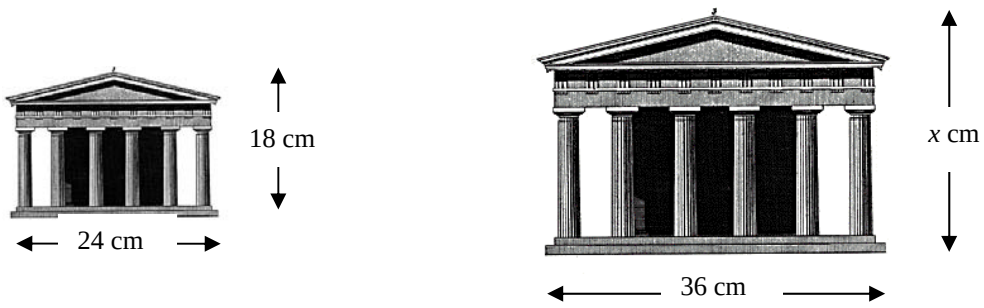
(a)



(b)



(c)



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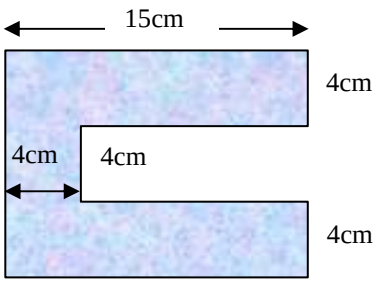
S3 General Homework 19 – Area 1

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 The shape is made from rectangles.



Calculate the area of the shape.

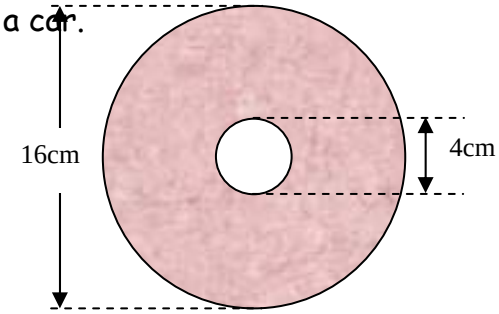
2 The diagram shows the disc brake for a car.

Calculate the area of:

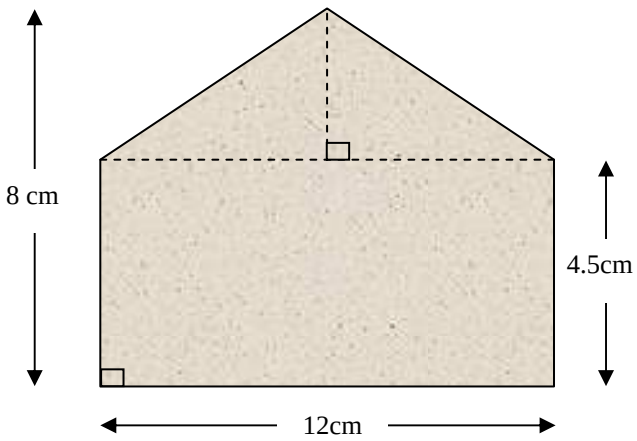
a) the outer circle;

b) the inner circle;

c) the shade brake disc.



3 Calculate the area of the end of the house that is made up of a rectangle and a triangle.



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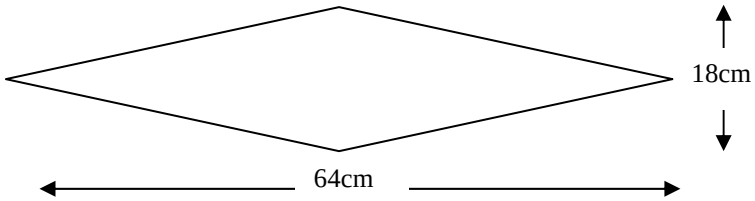
S3 General Homework 20 – Area 2

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 The shape is a rhombus.



The length of the large diagonal is 64 centimetres.

The length of the small diagonal is 18 centimetres.

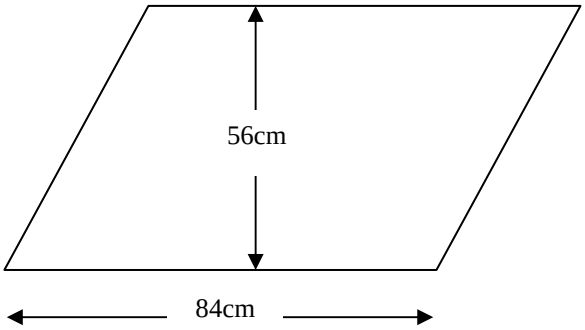
Calculate the area of the rhombus.

2 The diagram shows a parallelogram.

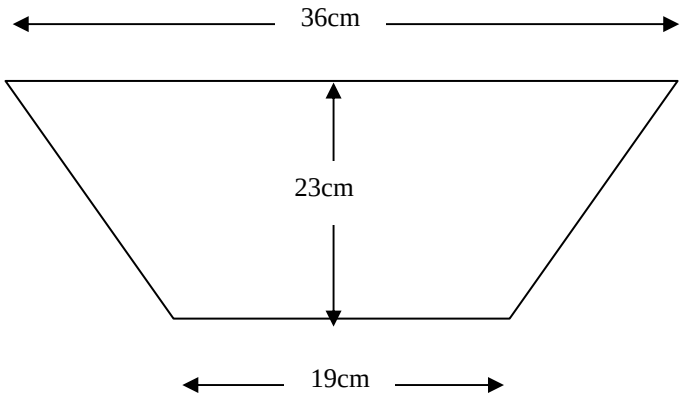
The length of one side is 84 centimetres

The distance between the parallel sides is 56 centimetres.

Calculate the area of the parallelogram



3 Calculate the area of the trapezium.



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S3 General Homework 21 – Wages 1

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Graham works 35 hours a week as a baker.

He is paid at a basic rate of £6.80 per hour

a) Calculate his weekly wage.

b) Graham works 8 hours overtime. He is paid at double time.

Calculate how much he is paid for his overtime work.

c) Calculate his total wages for the week

2 Jennifer works a basic 35 hour week selling glasses

She is paid at a basic rate of £5.40 per hour.

On Saturday she works for 4 hours of overtime at time and a half.

On Sunday she works 3 hours at double time.

a) Calculate her basic weekly wage

b) Calculate how much she earned on Saturday

c) Calculate how much she earned on Sunday

d) Calculate her total wages for the week

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S3 General Homework 22 – Wages 2

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

1 Copy and complete this wage slip.

Basic Wages	**Overtime**	**Bonus**	**Expenses**	**Gross Pay**
£671.509	£66.00	£45.00	£25.45	
Income tax	**Nat Ins**	Superannuation	**Other**	**Total Deductions**
£160.21	£36.16	£35.41	£1.67	
			Net Wages	

2 Copy and complete this wage slip:

Pay	
32 hours at £5.20 per hour	
8 hours overtime at time and a	
Bonus	£15.00
Gross Pay	
Deductions	
Income Tax	£27.45
National Insurance	£10.68
Total Deductions	
Net Pay	

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S3 General Homework 23 – Income Tax

SHOW **ALL** WORKING REQUIRED TO ANSWER EACH QUESTION

Income tax rates

	Taxable income
Lower Rate 20%	£1 – 3000
Basic rate 25%	£3001 – 24 000
Higher rate 40%	Over £24 000

1 

Fredrick earns £7 850 per year. He has a tax allowance of £5165.

Calculate the amount of income tax he pays each year.

2 Marcia earns £17 250 per year. She has a tax allowance of £3445.

Calculate the amount of income tax she pays each year.

3 

Cynthia earns £34 800 per year. She has a tax allowance of £5165.

Calculate the amount of income tax she pays each year.