

1. The radius of the planet Jupiter is 114,240 kilometres at the equator.  
Calculate the circumference of Jupiter.  
Give your answer to the nearest whole kilometre

2. The distance between Verona and Milan is 158 kilometres.  
A train takes 1 hour 40 minutes to travel between these cities.  
Find the average speed of the train.



3. John drives from Edinburgh to Inverness at an average speed of 76 kilometres per hour.  
The journey takes him 3 hours and 45 minutes.  
How far is it from Edinburgh to Inverness ?

4. Alice Anderson has a part-time job in a call centre.  
Her basic rate of pay is £6.50 per hour.  
At weekends she gets paid overtime at time and a half.  
Last week she was paid £136.50, which included 4 hours overtime.  
How many hours did she work at the basic rate ?



5. a) John is going to Italy on holiday.  
He changes £500 to Euros.  
The exchange rate is £1 = 1.46 Euros.  
How many Euros will he get ?
- b) While in Italy he decides to visit Switzerland for a day.  
He wants to change 100 Euros to Swiss Francs.  
John knows the exchange rate is £1 = 2.33 Swiss Francs.  
How many Swiss Francs should he get for 100 Euros ?
6. Paul has a box of pencils, which contain 90 normal pencils and 10 coloured pencils  
The coloured pencils are: 4 Red, 2 Blue, 1 Yellow and 3 Green.  
Assuming that he picks a coloured pencil,  
what is the probability that he will **NOT** choose a green one

7. a) Solve algebraically  $5x - 2 = 2x + 19$
- b) Factorise fully  $12 + 8p$

8. a) Multiply out the brackets and collect like terms  $3(2w+1) + 2(8-w)$   
 b) Solve the inequality  $3x - 4 < 11$
9. a) Solve algebraically the equation  $4(3x + 2) = 68$   
 b) Factorise  $15p + 20$
10. a) Simplify  $3(2x + 4) + 4(x - 2)$   
 b) Solve algebraically the inequality  $6x + 2 \leq 20$

11. Davina sees this advertisement for CAR HIRE while on holiday in Spain.

<b>UNLIMITED MILEAGE, INSURANCE INCLUDED</b>	
Locus Speedster	3100 pesetas per day
	20000 pesetas per week
A-Drive Trekcar	5560 pesetas per day
	35000 pesetas per week
<b>ADD 15% TAX</b>	

She decides to hire the Trekcar for 4 days.

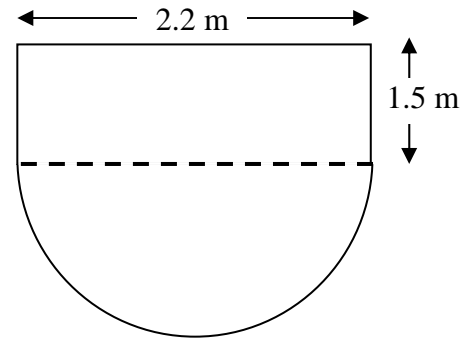
Find the cost in pounds sterling, of hiring the car if the exchange rate is  $\text{£}1 = 256$  pesetas.

12. George went on holiday to America.  
 Before he went he changed  $\text{£}850$  into US dollars (\$) at the rate  $\text{£}1 = \$1.7$
- a) How many dollars did he receive.
- b) He spent \$ 963 in America.  
 When he returned to the UK, he changed his dollars back into pounds at the rate of  $\text{£}1 = \$1.62$ .  
 How much did he receive to the nearest 10p ?

13. The floor of a conservatory consists of a rectangle and a semicircle.

The floor has the shape shown below.  
The measurements are in metres.

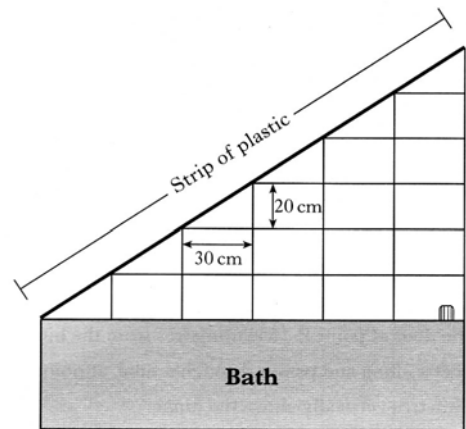
Find the total area of the floor.



14. The diagram below shows the wall Jamie has tiled above the bath in his house.

He used rectangular tiles, some of which he halved.  
The length of each tile is 30 centimetres.  
The breadth of each tile is 20 centimetres.

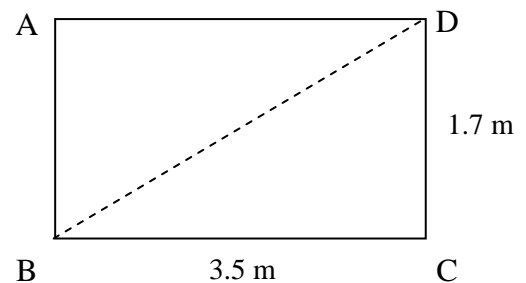
A strip of plastic is fitted along the top of the tiles.  
Calculate the length of the strip of plastic.



15. Angus is setting out the base for a greenhouse.

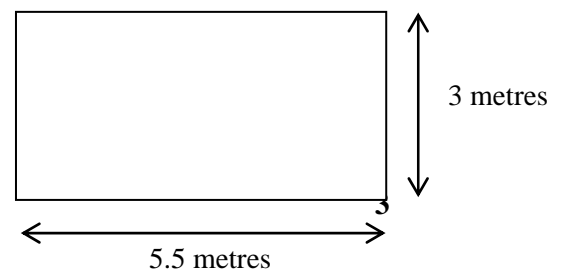
The greenhouse has a rectangular base 3.5 metres by 1.7 metres.

Calculate the length of the diagonal BD of the base of the greenhouse.



16. John is laying a concrete floor for his garage.  
The floor is to be a rectangle 5.5 metres by 3 metres.

To check the floor is rectangular, John measures a diagonal.  
What should this measurement be ?



17. Jayne is 14 years of age and a member of Kelly's Health Club.

She receives details of next year's subscription rates.

They are as follows:

<i>Category of member</i>	<i>Payment in full</i>	<i>Payment by instalments</i>
Adult	£390	12 payments of £36
Junior (Under 16 years of age)	£195	12 payments of £18
Husband and Wife	£695	12 payments of £65

- Jayne decides to pay by instalments.  
How much extra will she pay ?
- Express this extra cost as a percentage of the payment in full.  
Give your answer correct to 1 decimal place.

18. George Gibbs is a chef, below is shown his **weekly** payslip.

Calculate his: a) Gross Pay      b) Total deductions      c) Net pay

<b>Employee</b> 128	GEORGE GIBBS	<b>Tax Code</b> 516H	<b>Week</b> 17
<b>Basic Pay</b> 270.00	<b>Overtime</b> 8.50	<b>Allowances</b> -	<b>Gross Pay</b>
<b>Income Tax</b> 42.39	<b>Pension</b> -	<b>Nat. Ins.</b> 21.15	<b>Total Dedns.</b>
			<b>Net Pay</b>

George is offered a job at a new restaurant that is opening in Edinburgh.

He is offered an annual salary of £15,375.

Is this more than his present wage. **Give a reason for your answer.**

19. The current, C amps, of an electrical appliance is calculated using the formula

$$C = \frac{P}{240} \quad \text{where P watts is the power rating.}$$

- a hair dryer has a power rating of 850 watts.
- The fuse used should be the one just bigger than the calculated current.
- The choice of fuses is 3 amp, 5 amp and 13 amp.

Which fuse should be used ?

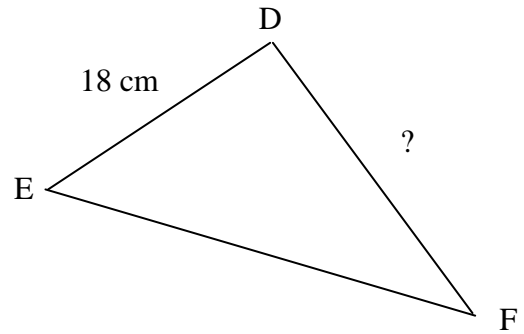
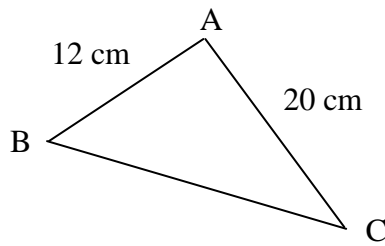
20. The kinetic energy of a moving object is given by the formula:

$$E = \frac{1}{2}mv^2$$

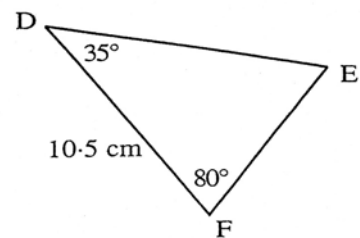
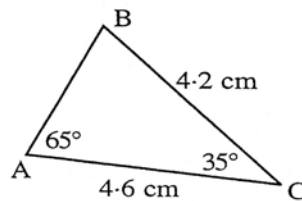
where m is the mass of the object in grammes and v is its velocity in metres per second.

Calculate the kinetic energy of an object of mass 50 gm moving at 30 metres per second.

21. Triangles ABC and DEF are similar. What is the length of DF



22. Study the two triangles shown.



- a) Explain clearly why the two triangles must be similar.  
 b) Use the fact that the two triangles are similar to calculate the length of the line DE.
23. The number of passengers travelling by bus from Glasgow to Edinburgh was recorded for 20 journeys.

29	45	36	27	41	38	14
48	31	39	24	17	23	34
29	38	42	12	32	36	

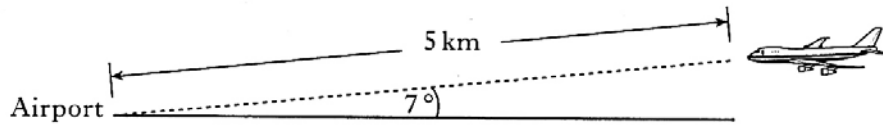
- a) Display the information in an ordered stem and leaf diagram  
 b) Find the median number of passengers.
24. Credit card companies advertise their percentage rates of interest (APRs).

The following data was collected by surveying a number of credit card companies.

17.9, 16.2, 15.1, 17.8, 17.9, 16.2, 16.5, 18.0, 14.9, 16.2, 15.6,  
 16.6, 16.7, 17.2, 16.8

- a) Make a stem and leaf plot to display the data. (5)  
 b) What is the median interest rate? (1)  
 c) What is the modal interest rate? (1)  
 d) What is the 5<sup>th</sup> highest interest rate? (1)

25.



An aircraft is approaching Glasgow airport.

The angle of elevation of the aircraft from the airport is  $7^\circ$ .

The aircraft is at a distance of 5 km from the airport.

Find the height of the aircraft, to the nearest metre.

**Do not use a scale drawing.**

26. Alex had the following test scores: 62, 51, 87, 93, 74, 62, 77, 59

a) Write down the:

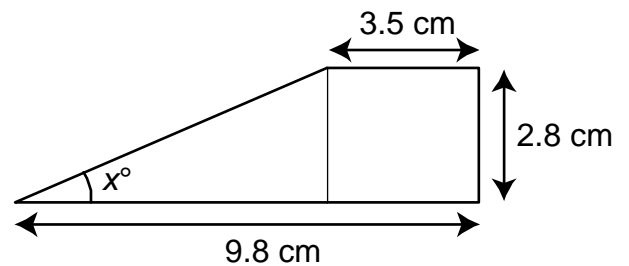
i) Range      ii) Mode      iii) Median

b) Calculate the mean (to 1 decimal place)

27. The diagram shows the design for a doorstep.

Calculate angle  $x^\circ$  to the nearest degree.

**DO NOT USE A SCALE DRAWING.**



28. PQRS is a trapezium

- $PQ = 7$  centimetres
- $QR = 4$  centimetres
- $SR = 10$  centimetres
- Angles  $PQR$  and  $QRS$  are both right angles.

Calculate the size of angle  $PSR$ .

**DO NOT USE A SCALE DRAWING**

