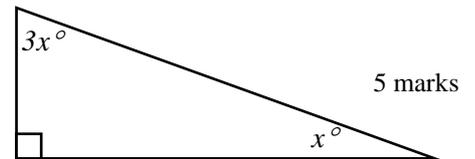


<i>DO NOT WRITE ON THIS PAPER</i>	TIME 2 hours	<i>Paper 4 of 5 from ZigZag Education</i>
Sample GCSE Examination Paper Intermediate Tier Calculator Paper	Standard Equipment: lined or squared paper, pen, pencil, ruler, CALCULATOR. Additional Equipment: graph paper, pair of compasses, plain paper. Protractor Q10.	

1. Solve the equations–
- a) $7x + 3 = -11$
- b) $q + 3 = 3q + 99$ 5 marks
2. Find the value of y when $x = -2$
- a) $y = 7 + 3x$
- b) $y = 7 - 3x$ 4 marks

3. a) Work out a formula for the angle sum of the triangle.
- b) Calculate x .



4. Work out the following giving your answer to a suitable degree of accuracy–
- (a) 1.66^3
- (b) 1.66^{11} 4 marks

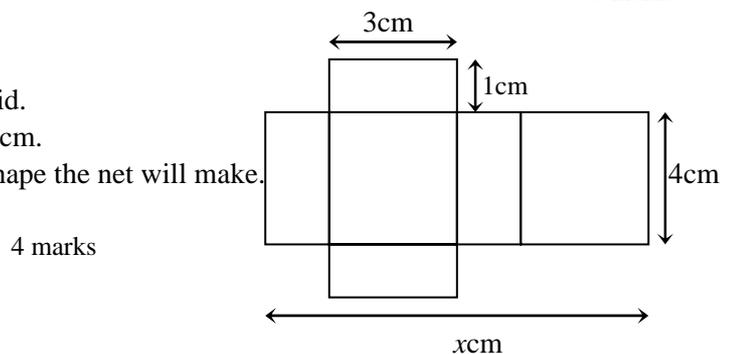
5. a) Showing your working order the following fractions starting with the smallest–

$$\frac{2}{3}, \frac{1}{2}, \frac{4}{7}, \frac{5}{6}, \frac{83}{100}$$

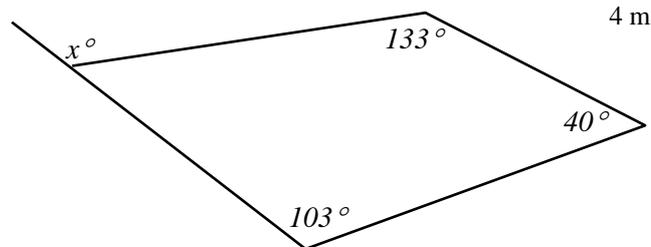
- b) Write down a fraction which is bigger than $\frac{5}{6}$ and smaller than $\frac{6}{7}$. 6 marks

6. A car normally costs £12,000.
Joha pays with cash and receives a 20% discount.
Calculate the cost of the car after the discount. 3 marks

7. This is the net of a simple three dimensional solid.
- a) Calculate the length of the net marked x cm.
- b) Calculate the surface area of the solid shape the net will make.



8. Calculate the missing angle x . 4 marks

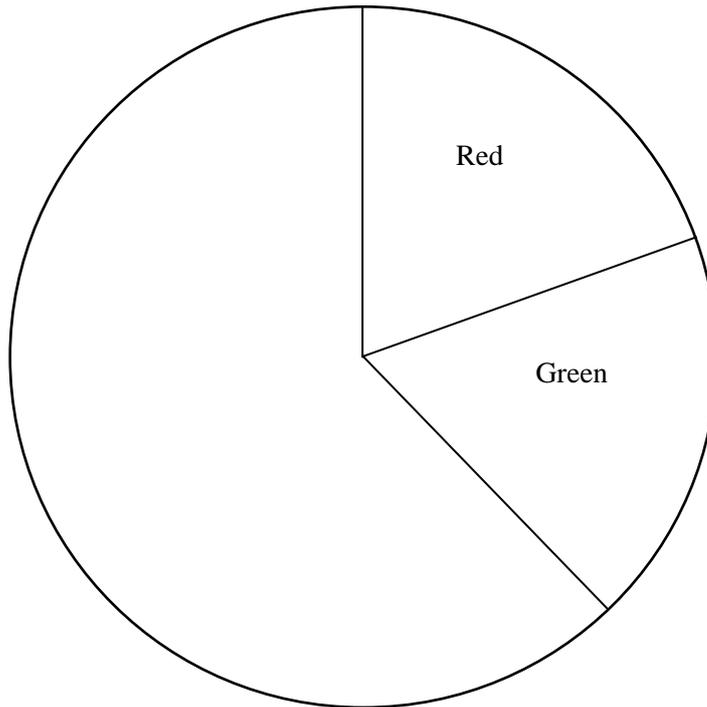


9. a) How many square metres is 1cm^2 .
- b) How many square centimetres is 4m^2 . 4 marks

10. In a survey, 720 people were asked to record the colour of their cars.
Some of the information is shown in the table.

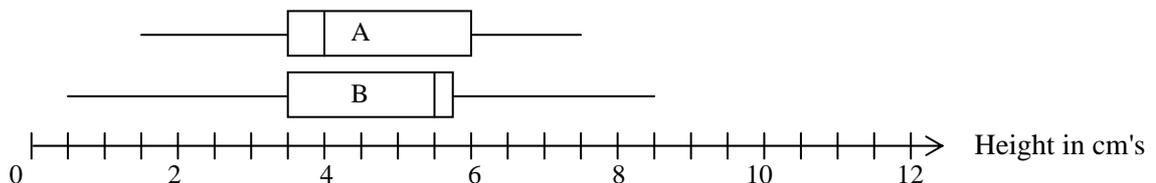
Colour of Car	Number of people
Red	?
White	126
Blue	?
Silver	148
Green	?
Other	90

The same information is also shown in a pie chart. The pie chart is incomplete. Complete the pie chart. 6 marks



How many blue cars were recorded in the survey?

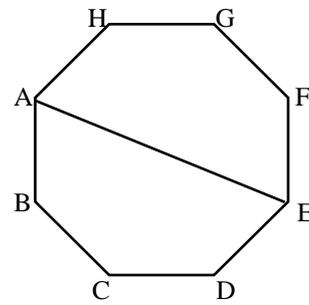
11. 200 plant seeds were divided into 2 groups. Group A and group B.
Group A were grown in field A. Group B were grown in field B.
The box and whisker plot of the heights of the plants is shown below.



- a) Comment on one statistical feature that is the same between the two groups.
The plants are sold. The plants achieve a selling price dependent on how tall they are.
The taller plants get more money. The plants sell for £3 per cm in height.
The farmer can only sell the plants from one of the fields.
- b) Which plants, from field A or B, do you think the farmer should sell? Justify your answer.
- c) Estimate the 3rd quartile for group B.

4 marks

12. The shape shown is a regular octagon of side 5cm.
Find length AE to 3 significant figures.



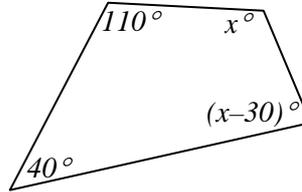
5 marks

13. Simplify the expressions

a) $2x^5 \times 3x^6$ b) $\frac{y^6}{y^2}$ c) $(y^7)^5$

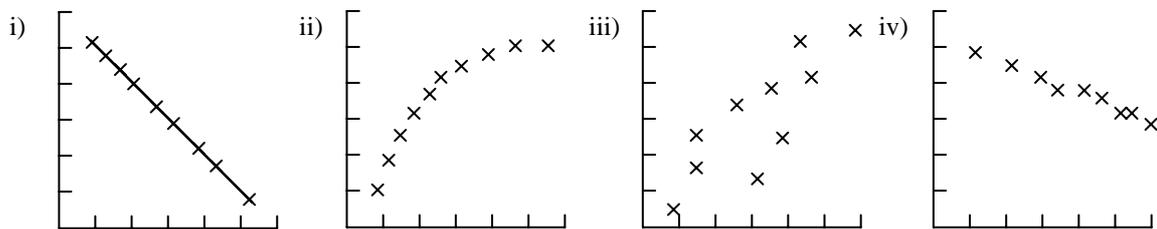
3 marks

14. a) Work out an equation in x .
b) Solve your equation to find x .



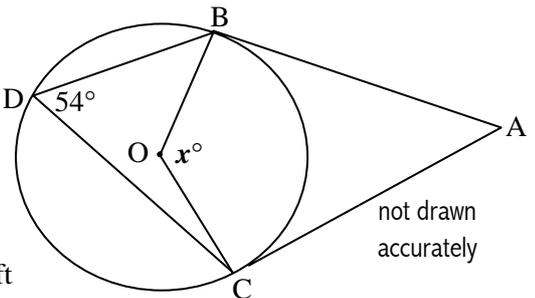
4 marks

15. Describe the correlation, if any, in each of the scatter diagrams below. A line of correlation is shown on diagram i).



4 marks

16. a) Calculate angle BOC, labelled x .
b) i) Write down angle ABO, justifying your answer.
ii) Calculate angle BAC.
A student says that ABDC is a cyclic quadrilateral.
c) Are they correct? Justify your answer.



D is now moved around the circumference, but remains to the left of BC, until OBDC forms a kite. Points O, B and C do not change.

- d) i) Which angles in the shape OBDC remain unchanged as D is moved into position?
ii) Given D's new position calculate angle OBD, justifying your answer.

6 marks

17. The diagram below shows the position of three radar stations, X, Y and Z. You do **not** need to construct an accurate copy of the points.

- a) A helicopter moves among the radar towers, such that it is equidistant from XY and ZY.
Using a ruler and compasses only, construct the locus of the helicopter.

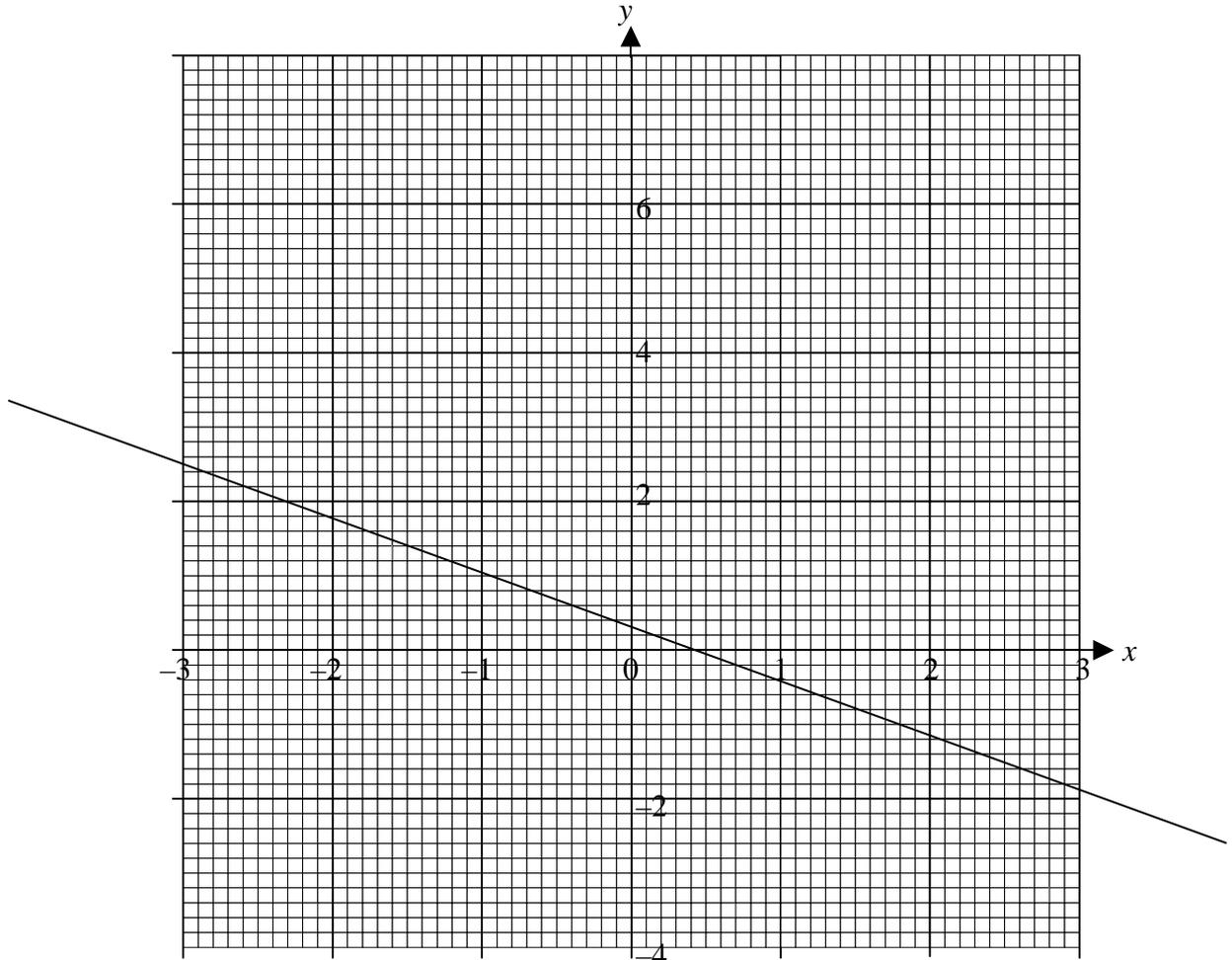
- b) At midnight, the helicopter is equidistant from X and Y.
On your diagram, use a **ruler and compasses only** to find the position of the helicopter, by construction - do not measure length.

4 marks



18. Estimate the equation of the graph of the straight line shown.

7 marks



19. a) Copy and complete the table of values for $y = x^2 - 2x - 1$

x	-2	-1	0	1	2	3
y				-2		

b) Using your table of values, draw a graph of $y = x^2 - 2x - 1$.

c) Use your graph to estimate the solutions to the equation $0 = x^2 - 2x - 1$

8 marks

20. Make w the subject of the following formulae

a) $s = w(r - 14)$

b) $p = qw^3$

5 marks

21. Factorise $x^2 - 16$

1 marks

22. $OX = 12\text{cm}$, $OY = 9\text{cm}$ as shown.
Chord length $RS = 24\text{cm}$.

a) Calculate the radius of the circle

b) Calculate the length of the chord PQ

4 marks

