1   A rectangle has perimeter 26cm. One side has length 5cm.
What is the area of this rectangle?   [4]

Perimeter = 26cm   5cm
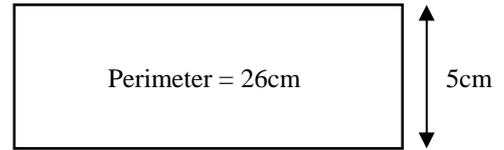
2   Sam buys a jacket. The jacket normally costs £30, but the price is reduced by 15% in a sale.
How much does Sam pay for the jacket?   [1]

3.   Solve the equations–
a) $3x + 3 = -18$
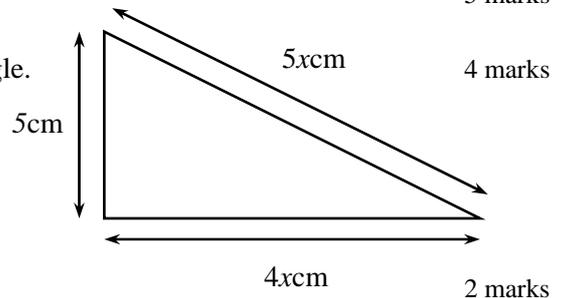b) $99q - 5 = 100q + 4$ 5 marks

4.   Find the value of y when $x = 3$
a) $y = 7 - 3x$
b) $y = x^2 + x^3$ 5 marks

5.   Work out a formula for the perimeter and area of the triangle.   4 marks
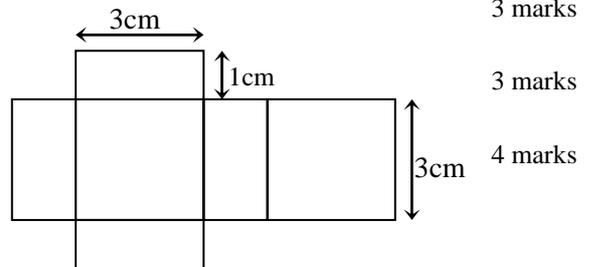
5xcm

5cm

4xcm   2 marks

6.   Work out–
(a) 169^2
(b) 7^4

7.   Showing your working order the following fractions starting with the smallest: $\frac{1}{100}, \frac{99}{100}, \frac{5}{6}, \frac{6}{7}, \frac{51}{60}$.

3 marks

8.   A car costs £12,000 plus vat at 17.5%.
Calculate the cost of the car after VAT has been added.   3 marks

3cm

1cm

9.   This is the net of a simple three dimensional solid.   3cm   4 marks

a)   What is the name of the three dimensional solid that the net will make?
b)   The solid made by this net has six faces. How many edges will this solid have?
c)   Calculate the volume of the solid shape the net will make.
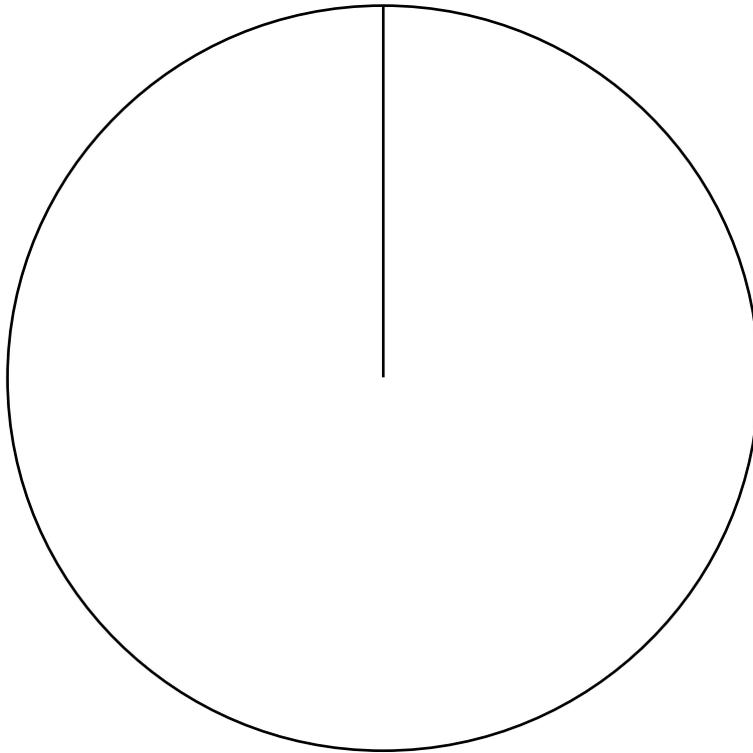
10.   Calculate the missing angles *x,* y and z.

$y°$
$z°$
$x°$ $77°$

$163°$
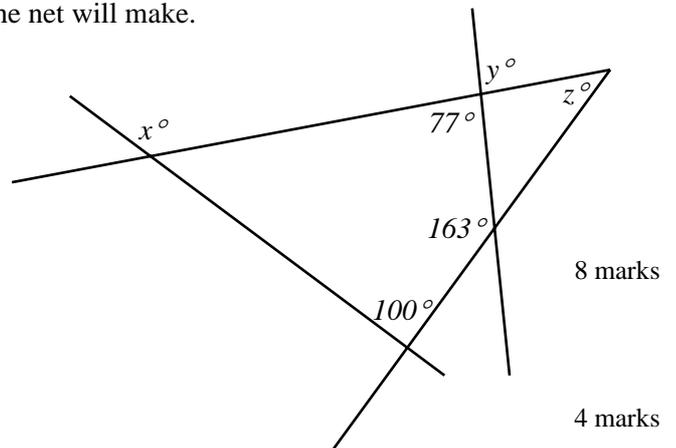
$100°$ 8 marks

11.   a)   How many cubic metres is 1cm^3?
b)   How many cubic centimetres is 4m^3?   4 marks

12.	Sarah asked 90 girls what their favourite takeaway foods were.
	Here are her results.

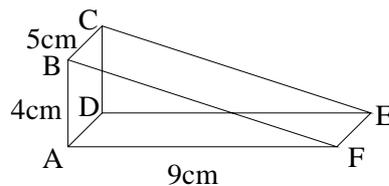| Food	Fish and chips	Chinese meal	Indian meal	Pizza	Chicken
Number of girls	21	13	15	24	17

    (a)	Draw a pie chart to show these results.

	Sarah also asked 72 boys about their favourite takeaway foods.
	She drew a pie chart to show her results, and the angle for fish and chips was 145°
	(b)	How many boys said that fish and chips was their favourite takeaway food?	7 marks

13.	ABCDEF is a solid prism.
	ABCD is a rectangle with AB = 4cm and BC = 5cm.
	ABF and DCE are congruent right-angled triangles.
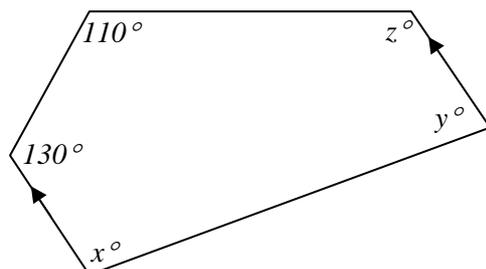	AF is 9cm.
	Find the volume of the prism.	3 marks

14.	A sequence begins 0, 3, 8, 15,…,…,
	a)	What are the next two numbers of the sequence?

	A different sequences begins –3, 0, 3, 6, 9,…,…
	b)	i)	Formulate an expression for the nth term in terms of n.
		ii)	Calculate the 100th and 101st terms.	5 marks

15.	Look at the diagram to the right–
	a)	Write down an equation linking x and y only.
	b)	Write down an equation linking x, y and z.
	c)	Find z.	5 marks

16.	Bag A contains 4 green balls and 7 yellow balls
	Bag B contains 7 green balls and 2 yellow balls.
	A ball is selected from each bag.
	Calculate the probability that both balls are yellow.	2 marks

17. *Copy the diagram before you start.*
   a)   Reflect the triangle in the line $x = –1$ and label your new triangle A'B'C'.
   b)   Rotate the <u>original</u> triangle ABC, 180^0 clockwise, about the point (0,2) and label your new triangle A"B"C".
   c)   Enlarge the <u>original</u> triangle ABC, by a scale factor 2, using (2,3) as the centre of enlargement. Label your new triangle A'''B'''C'''.
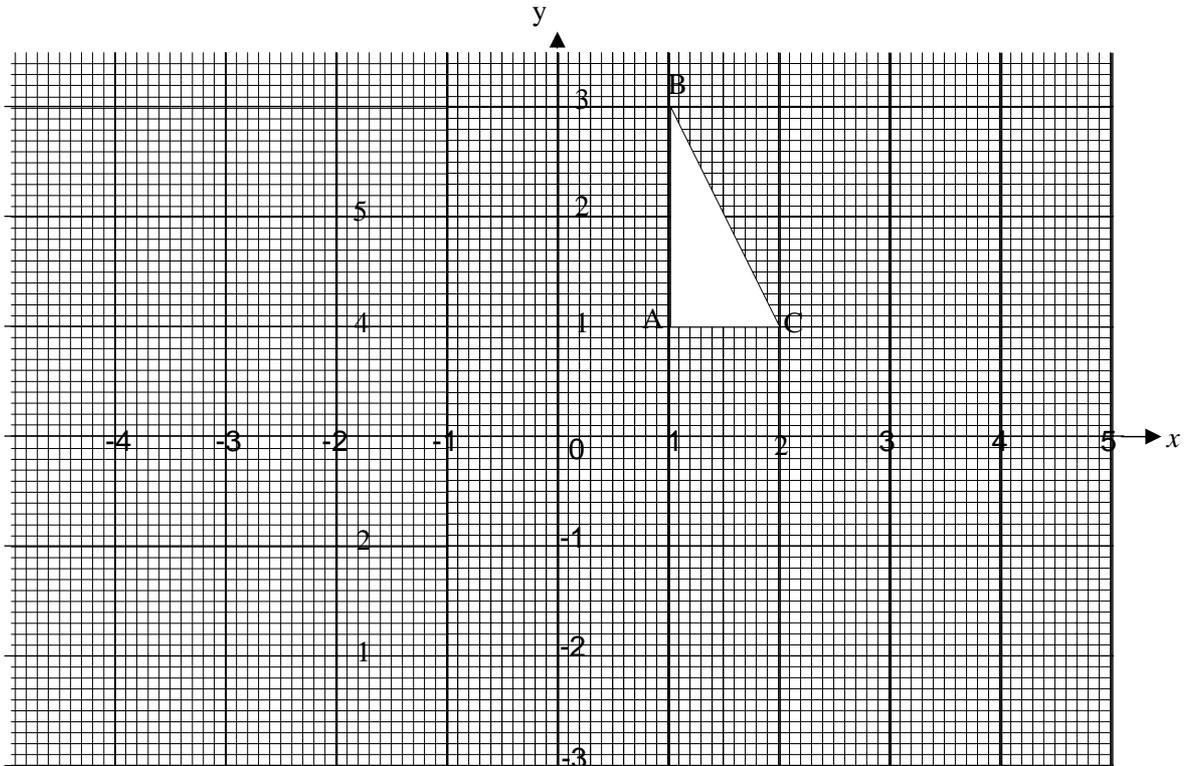
   The point A is reflected in the line y = 44 and becomes D.
   d)   What would the co-ordinates of D be?   7 marks

18. Solve the simultaneous linear equations:
      $3y – 2x = 4.8$
      $3x – 2y = 3.8$ 5 marks

19. a)   Write 148 as the product of primes.
     b)   Write 148^{10} as the product of primes.   3 marks

20. Jane flies at 30 km/hour from A to B.
     a)   What bearing should she be flying on?
     b)   How long to the nearest minute should the journey take?
     During her flight she realises that there are some problems with the helicopter's instruments.
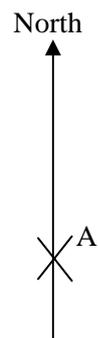   Jane does not know how far she has travelled and Jane does not know in what direction she has been travelling.
     It is known that Jane is within 10km of C.
     c)   Shade the possible positions that Jane might be.

SCALE
1cm to 5km
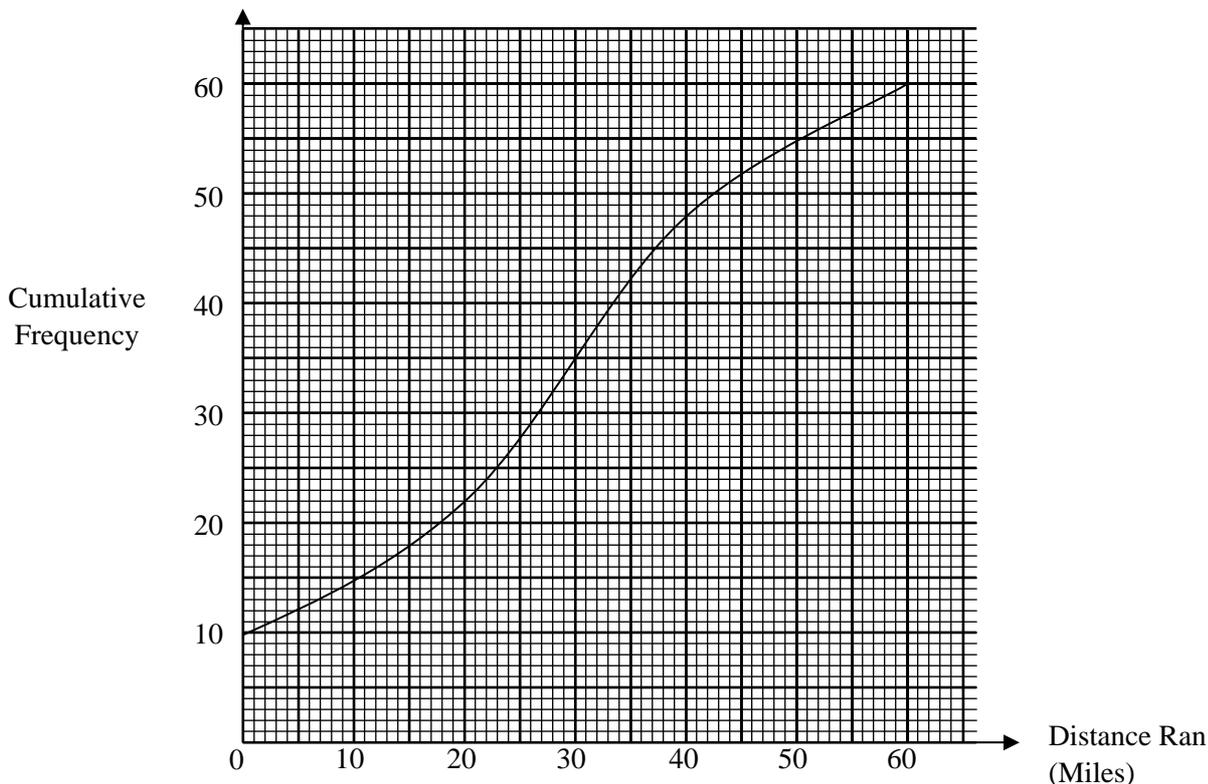
                                                                                5 marks

21. This cumulative frequency graph shows the running distances of the members of a running club, during the first week of training.
   a) How many runners did not run that week?
   b) How many runners ran 40 or more miles?
   c) Calculate the inter-quartile range.

22.

How to simplify $\sqrt{n}$ with n an integer–
1) Find any square number greater than 1, that is a factor of n.
2) Call this square number b.
3) Find a number c such that $c^2 = b$.
4) Write $\sqrt{n}$ in the form $\sqrt{c^2 \times d}$ with d an integer.
5) Then $\sqrt{n}$ is simplified as $c\sqrt{d}$.

For example consider $\sqrt{12}$.
1) 4 is a square number greater than 1, that is a factor of 12.
2) $b = 4$
3) $c = 2$ [i.e. $2^2 = 4$].
4) $\sqrt{12} = \sqrt{2^2 \times 3}$.
5) $\sqrt{12}$ is simplified as $2\sqrt{3}$.

a) Using the steps above or otherwise simplify $\sqrt{18}$.

In general $\sqrt{n} \times \sqrt{n} = n$, so for example $\sqrt{3} \times \sqrt{3} = 3$.

b) Given that r = $\sqrt{3}$ calculate r^3 exactly, simplifying your answer.

9 marks

c) Calculate an expression for the volume of this cylinder in the form $\dfrac{a\pi\sqrt{2}}{c}$, with a and c integers and where your answer is as simplified as far as possible.

√3cm
√2cm