AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

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LEAVING CERTIFICATE EXAMINATION, 2000

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MATHEMATICS - FOUNDATION LEVEL

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PAPER 2 (300 marks)

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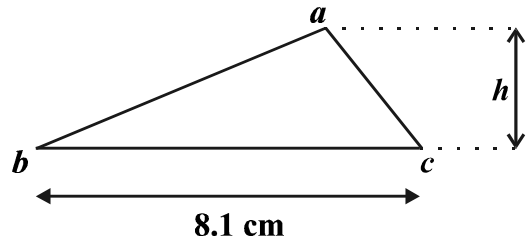**FRIDAY, 9 JUNE - MORNING, 9.30 - 12.00**

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Attempt **SIX QUESTIONS** (50 marks each).
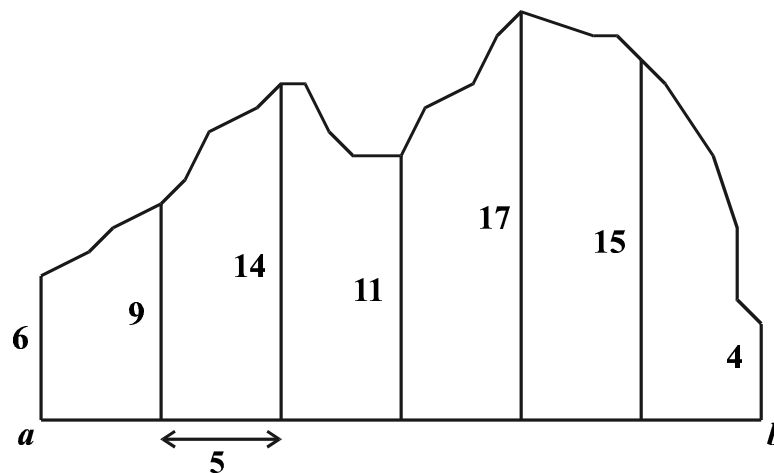
Marks may be lost if necessary work is not clearly shown.
A sheet of formulae will be given to you by the Superintendent.

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1. **(a)** The area of triangle abc is 10.125 cm^2.
The length of $[bc]$ is 8.1 cm.
The height of the triangle is h cm.

Calculate the value of h.

(b) The diagram below shows a site for sale.

The offsets of lengths 6, 9, 14, 11, 17, 15 and 4 metres are measured at intervals of 5 metres along $[ab]$.

Using Simpson's Rule, calculate the area of this site, correct to the nearest square metre.

2. **(a)** A small rectangular block measures 4 cm × 3 cm × 2 cm.
Calculate its volume.
Calculate the volume of 30 of these small blocks.

A large rectangular block has the same volume as the 30 small blocks.
The large block measures 8 cm × 9 cm × k cm.
Find the value of k.

(b) A wax sphere has surface area 1017.36 cm^2.
Calculate, taking $\pi = 3.14$,

        (i)   the radius of the sphere

        (ii)   the volume of the sphere.

A solid cylinder of radius 9 cm has the same volume as the wax sphere.
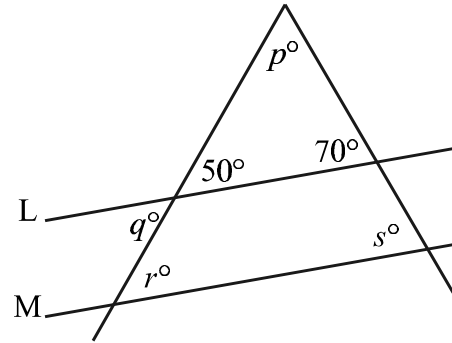Calculate the height, h, of the cylinder.
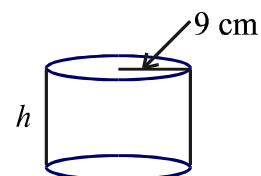
3. **(a)** The diagram shows an isosceles triangle.

Find the value of x and the value of y .
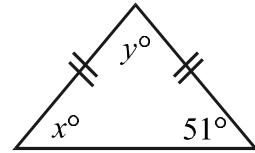
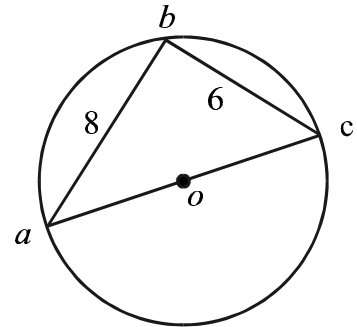**(b)** The lines L and M are parallel.

Find the value of

(i) p

(ii) q

(iii) r

(iv) s.

(c) a, b and c are points on a circle with centre o .
[ac] is a diameter of the circle.
$|ab| = 8$ cm and $|bc| = 6$ cm.

Find

(i)   the measure of $\angle\ abc$

(ii)   the area of triangle abc

(iii)   the length of the diameter [ac]

(iv)   the area enclosed by the circle, taking $\pi = 3.14$.

4. **(a)** Plot the points $a(3, 3)$ and $b(-1, 1)$ on graph paper.
Find the midpoint of [ab].

(b) $p(-3, 2)$ and $q(2, 14)$ are points.

(i)   Find the length of [pq].

(ii)   Find the slope of pq .

(iii)   Find the equation of the line pq .

(c) The line L has equation $4y = -3x + 12$.
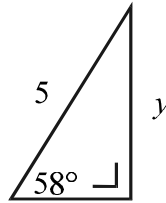Write down the slope of L.

Find the equation of the line M which passes through the point $(1, 2)$ and is perpendicular to L.

The point $(h, 8)$ lies on the line M.
Find the value of h .
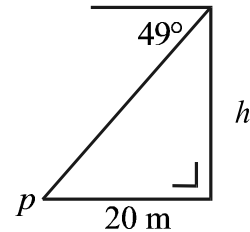
5. **(a)** Given that $\tan A = \dfrac{3}{4}$, write down the value of

      (i)   sin A
      (ii)   cos A
      (iii) tan B.
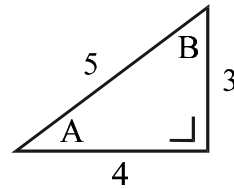
(b) Calculate the value of y, correct to two places of decimals.

(c) The angle of depression of a point p from the top of a building is 49°.
The point p is on level ground 20 m from the foot of the building.
Calculate the height h of the building, correct to the nearest metre.

6. **(a)** A lunch consists of soup, main course and dessert.
The restaurant offers :

                two different types of soup
                three different main courses
                four different desserts.

How many different lunch selections are possible ?

(b) A hat contains 40 tickets. 11 of these tickets are red, 9 are green and 20 are white.
One ticket is picked at random from the hat.

Find the probability that it is

      (i)   a red ticket
      (ii)   a green ticket
      (iii) not a green ticket.

(c) List the eight possible ways in which three children can be made up of girls and boys.
For example, three of the possible ways are:
                boy, boy, boy;
                boy, boy, girl;
                boy, girl, boy.

If all the possible ways are equally likely, find the probability that

      (i)   all of the children are girls

      (ii)   at least two of the children are boys

      (iii) only one of the children is a girl.

7. **(a)** The results of a survey of the time spent by 40 people travelling to work are shown in the table below.

Time in minutes	0 – 10	10 – 20	20 – 40
Number of people	5	15	20

Draw a histogram to illustrate the information given in the table.
Put the time in minutes on the horizontal axis.

(b) 70 students at a concert are asked their ages. The results are as follows :

Age (in years)	13 – 15	15 – 17	17 – 19	19 – 21	21 – 23
Number of students	7	12	22	23	6

Note:- 13 – 15 means 13 years of age but not yet 15.

Copy and complete the cumulative frequency table below :

Age (in years)	<15	<17	<19	<21	<23
Number of students	7	19			

Draw the cumulative frequency curve.
Put the number of students on the vertical axis.

Use your curve to estimate the number of students who are 16 years of age or more but less than 20 years of age.

**(c)** Find the mean and standard deviation of the numbers

3,   4,   6,   7

correct to two places of decimals.

8.   **(a)**   Construct a triangle *abc* where |*ab*| = 8 cm, |*bc*| = 5 cm and |*ac*| = 7 cm.
Measure the angle between the sides [*ab*] and [*bc*], as accurately as possible.

(b)   The triangle *o c' d'* is an enlargement of the triangle *ocd*.
The centre of the enlargement is *o*.
|*oc*| = 5.5, |*cc'*| = 3.3 and |*od*| = 5.
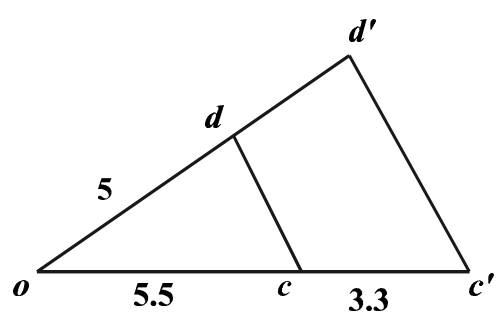
(i)   Calculate the scale factor of the enlargement.

(ii)   Find the length of [*od'*].

(iii)   The area of triangle *o c' d'* is 21.12 square units.
Find the area of triangle *ocd*.

(c)   Copy the triangle *abc* into your answer book.
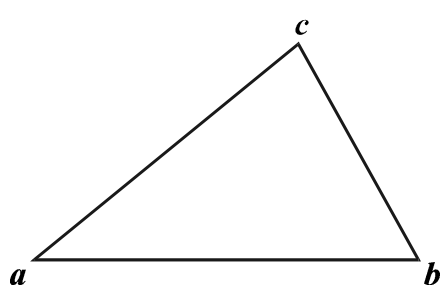
Show how to draw the inscribed circle of the triangle *abc*.