Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2010

MATHEMATICS ─ FOUNDATION LEVEL

PAPER 2 (300 marks)

MONDAY, 14 JUNE – MORNING, 9:30 to 12:00

Attempt **SIX QUESTIONS** (50 marks each).

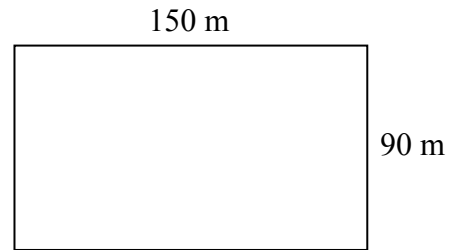WARNING: **Marks will be lost if all necessary work is not clearly shown.**

Answers should include the appropriate units of measurement, where relevant.

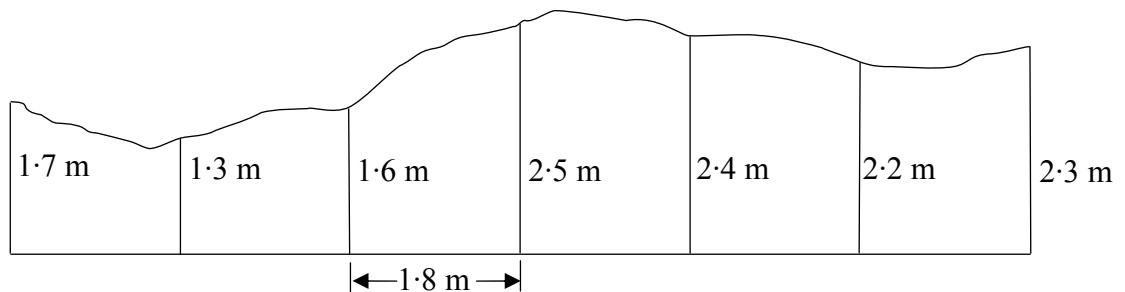A sheet of formulae will be given to you by the Superintendent.

1. **(a)** A rectangular field is 150 m long and 90 m wide.

Find

(i) the area of the field

(ii) the length of the perimeter of the field.

150 m

90 m

(b) One side of an old garden fence is shown in the diagram.

1·7 m   1·3 m   1·6 m   2·5 m   2·4 m   2·2 m   2·3 m

|←—1·8 m—→|

The height of the fence is measured as 1·7, 1·3, 1·6, 2·5, 2·4, 2·2, and 2·3 metres at intervals of 1·8 metre along the base of the fence as shown.

(i) Use Simpson's rule to calculate the area of the side of the fence in m^2.

(ii) The owner paints this side of his fence.
One tin of paint covers 5·4 square metres.
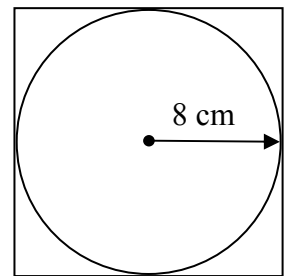How many tins of paint does he use?

2. **(a)** The diagram shows a rectangular block 70 cm long, 30 cm wide and 8 cm high.
Calculate the volume of the rectangular block.
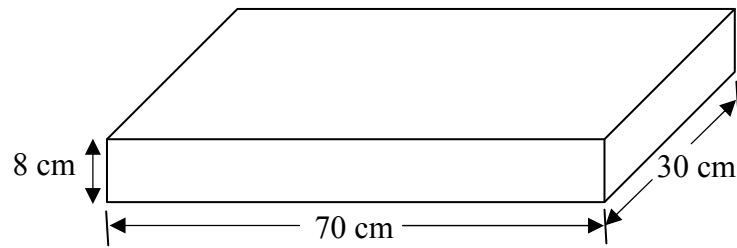
(b) The diagram shows a circle inscribed in a square.
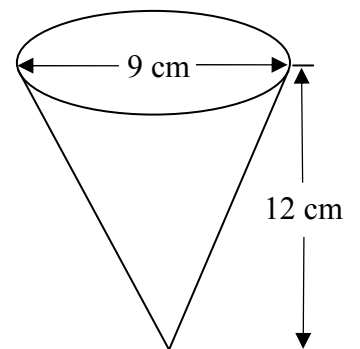The radius of the circle is 8 cm.

   (i) Find the area of the circle.
   Give your answer correct to the nearest cm^2.

   (ii) Find the area of the square.

(c) A container in the shape of an inverted cone is
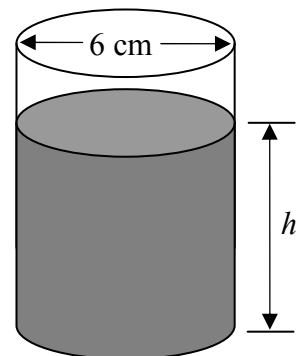filled with water.

The diameter of the cone is 9 cm and the height
is 12 cm.

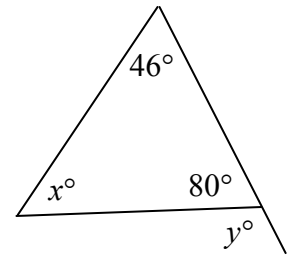   **(i)** Find the volume of water in the container, in terms of π.

The water is then poured into a cylindrical can of
diameter 6 cm.

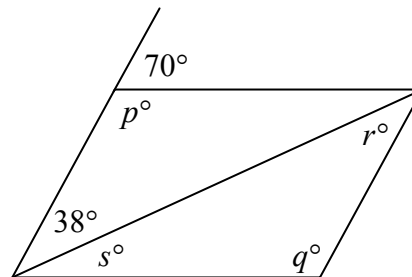   **(ii)** Find h, the depth of water in the can.

3. **(a)** Find the value of x and the value of y.

(b) The diagram shows a parallelogram.

   (i) Find the value of p.

   (ii) Find the value of q.

   (iii) Find the value of r.

   (iv) Find the value of s.
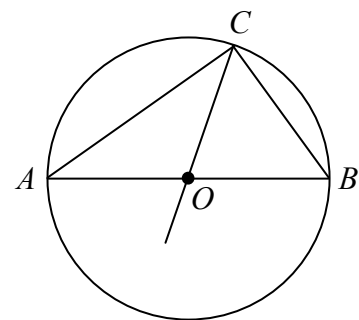
(c) The diagram shows a circle with centre at O.
   $[AB]$ is a diameter of the circle.
   $|\angle AOC| = 104°$ and $|OC| = 6\,\text{cm}$.

   (i) Find $|\angle OBC|$.

   (ii) Find $|\angle CAO|$.

   (iii) Find $|AB|$.

4. **(a)** Plot the points $A(4, 1)$ and $B(-2, 3)$ on graph paper.

   Show on your diagram the midpoint of $[AB]$.

(b) $P(2, 4)$ and $Q(-3, 1)$ are two 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 $2y = 3x + 1$.

   The point R has co-ordinates $(1, 2)$.

   (i) Show that the point R lies on the line l.

   (ii) Write down the slope of l.

   (iii) Find the equation of the line k, which passes through the point $(4, -1)$ and is parallel to l.

5. **(a)** The diagram shows a right-angled triangle with sides of length 3, 4 and 5 cm and angles named *A* and *B*.
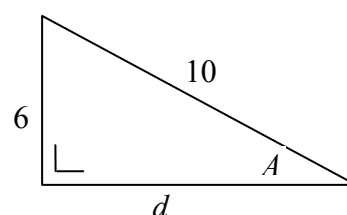Write as a fraction
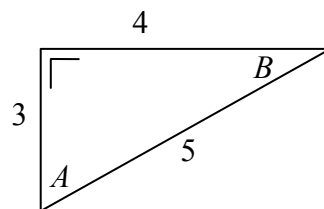
    (i) $\tan A$.

    (ii) $\cos B$.

(b) A ladder leans against the top of a wall.
The ladder makes an angle of 71° with the ground.
The foot of the ladder is 2 m from the base of the wall.
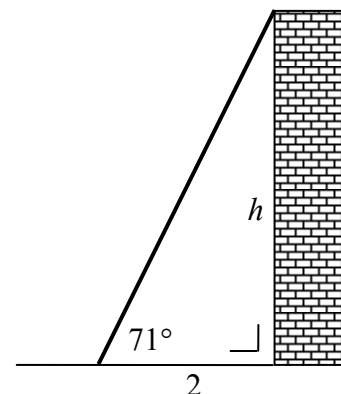
Find the height, *h*, of the wall.
Give your answer correct to one decimal place.

(c) **(i)** Find the length of the side *d* in the diagram.

    (ii) Find the measure of the angle *A*.
Give your answer to the nearest degree.

6. **(a)** Lucy is going to wear a top, a skirt and a jacket as her outfit to a school disco. She has a choice of 3 tops, 4 skirts and 2 jackets. How many different outfits could she wear?

(b) The blood groups of 95 people who donate blood at a clinic are as follows:
    18 people belong to group A,
    27 people belong to group B,
    50 people belong to group O.

A person is selected at random from the donors. What is the probability that this person

    (i) belongs to group A

    (ii) belongs to group B

    (iii) belongs to either group A or group O

    (iv) does not belong to group O?

(c) In a class of 80 students, each student studies one language.
The information is given in the table below.

	French	Spanish	German
Boys	12	20	5
Girls	16	24	3

A student is chosen at random. Find the probability that

    (i) the student is a boy

    (ii) the student studies French

    (iii) the student is a girl studying Spanish

    (iv) the student does not study German.

7. **(a)** The mean of the five numbers

$$1, \ 5, \ x, \ 8, \ 9$$

is 6. Find the value of x.

(b) A survey of the time spent by 50 teenagers on their mobile phones over a certain weekend gave the following information:

Number of minutes	0 – 10	10 – 20	20 – 30	30 – 40	40 – 60
Number of teenagers	7	8	22	10	3

Note: 10 – 20 means 10 minutes or more but less than 20 minutes.

(i) Copy and complete the cumulative frequency table:

Number of minutes	< 10	< 20	< 30	< 40	< 60
Number of teenagers					

(ii) Draw the cumulative frequency curve.

Use your cumulative frequency curve to estimate

(iii) the median number of minutes spent on the phone

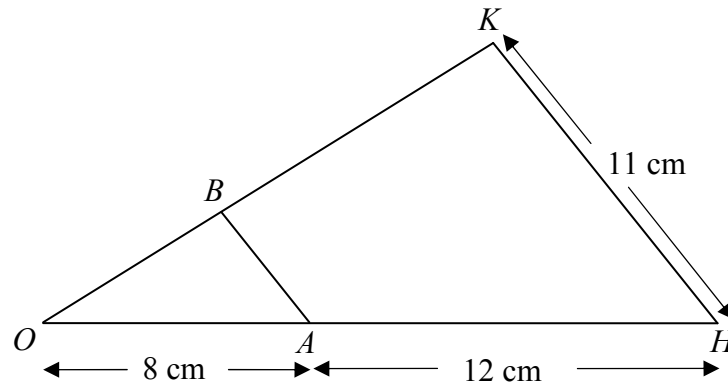**(iv)** the number of teenagers who spent more than 35 minutes on the phone.

(c) Find the standard deviation of the numbers

$$5, \ 7, \ 8, \ 12,$$

correct to two decimal places.

8. **(a)** **(i)** Draw a rectangle in your answer book.

(ii) Draw the two axes of symmetry of the rectangle.

(b)

The triangle *OHK* is the image of the triangle *OAB* under an enlargement of centre *O*.

$|OA| = 8$ cm, $|AH| = 12$ cm and $|HK| = 11$ cm.

(i) Find the scale factor of the enlargement.

(ii) Find $|AB|$.

(iii) The area of the triangle *OAB* is $18\,\text{cm}^2$.
Find the area of the triangle *OHK*.

(c) **(i)** Draw any triangle in your answer book.

(ii) Construct the circumscribed circle of this triangle.

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