Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION 2008

MATHEMATICS ─ FOUNDATION LEVEL

PAPER 2 (300 marks)

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

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

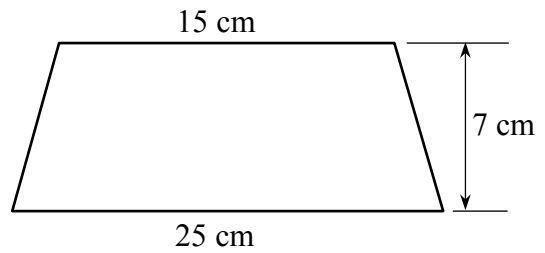**WARNING: Marks will be lost if all necessary work is not clearly shown.**

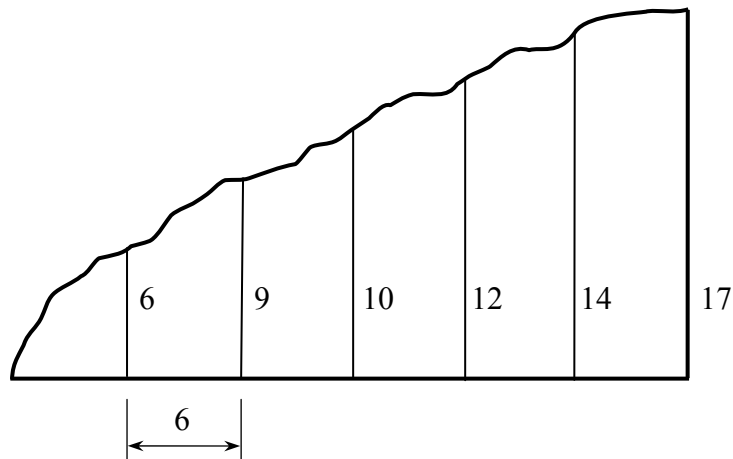**Answers should include the appropriate units of measurement, where relevant.**

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

1. **(a)** The parallel sides of a trapezium measure 15 cm and 25 cm. The height is 7 cm. Calculate the area of the trapezium.


(b) The diagram below shows a corner of a lawn that needs to be replanted with grass seed.

Offsets of lengths 6, 9, 10, 12, 14 and 17 metres are measured at intervals of 6 metres as shown.

(i) Use Simpson's rule to calculate an estimate of the area of this corner of the lawn.

(ii) One box of lawn seed is needed for every 40 m^2 of the lawn. How many boxes of seed will be needed?

2. **(a)** A rectangular chocolate bar is 9 cm long,
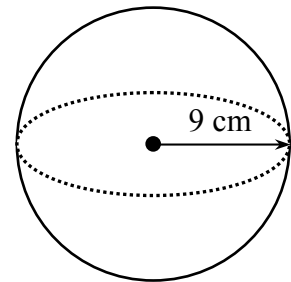3 cm wide and 1 cm thick.
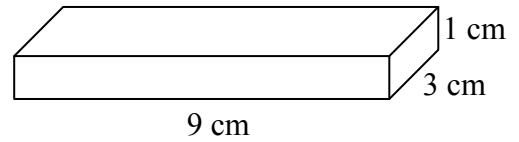
Calculate the volume of chocolate in the bar.

1 cm

3 cm

9 cm

(b) The diagram shows two circles inscribed in a rectangle.
The radius of each circle is 6 cm.
Find the area of the rectangle.
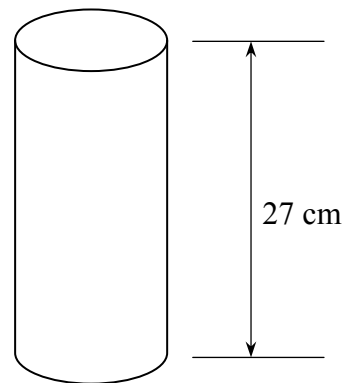
6 cm   6 cm
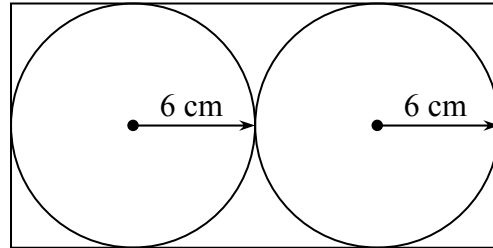
(c) A sphere and a cylinder have the same volume.
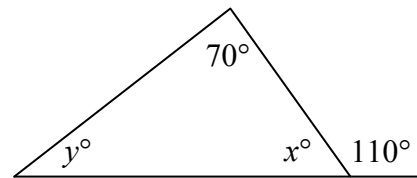The sphere has a radius of 9 cm.

(i) Calculate the volume of the sphere in terms of π.

9 cm

(ii) The height of the cylinder is 27 cm.
Calculate the radius of the cylinder.
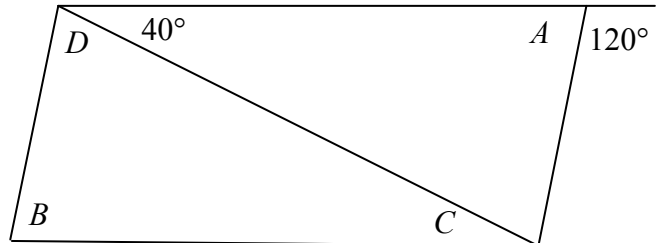
27 cm

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

70°

$y°$ $x°$ 110°

(b) The diagram shows a parallelogram.

Find the measure of

(i) the angle A

(ii) the angle B

(iii) the angle C

(iv) the angle D.

D 40° A 120°

B C

(c) The diagram shows a circle with centre o and radius 6·5 cm.

(i) Write down the measure of the angle $\angle pqs$.

(ii) Write down the length of $[oq]$.

(iii) Write down the length of the diameter of the circle.

(iv) If $|qs| = 5$ cm, find the length of $[pq]$.

q

p o s
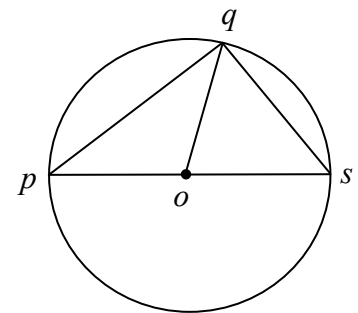
4. **(a)** $p\,(-2,\,1)$ and $q\,(4,\,3)$ are two points.

(i) Plot the points p and q on graph paper.

(ii) Find the co-ordinates of the midpoint of $[pq]$.

(b) $a\,(-6,\,6)$ and $b\,(-3,\,4)$ are two points

**(i)** Find the length of $[ab]$.

(ii) Find the slope of ab.

(iii) Find the equation of the line ab.

(c) The line L has equation $2y = 5x + 2$.

The point r has co-ordinates $(0,\,1)$.

(i) Show that the point r lies on the line L.

(ii) Find the slope of L.

(iii) Find the equation of the line K, which is perpendicular to L and contains the point r.

5. **(a)** The diagram shows a right-angled triangle with sides of length 9, 12 and 15 and angles named *A* and *B*.
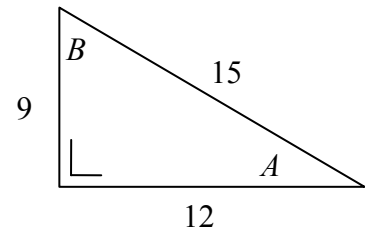
(i) Write down cos *A* as a fraction.

(ii) Write down tan *B* as a fraction.

(b) Find the measure of the angle *X* in the diagram, correct to the nearest degree.
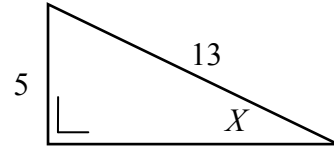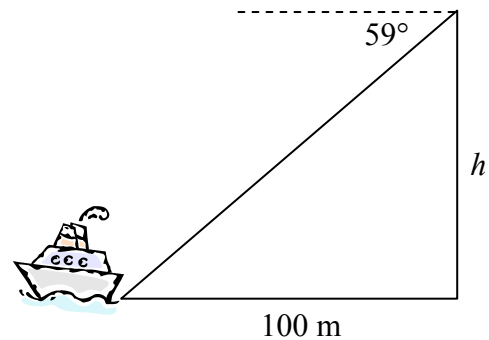

(c) A boat that is anchored out at sea can be seen from the top of a vertical cliff.

The angle of depression from the top of the cliff to the boat is 59°, as shown in the diagram.

The boat is 100 m from the foot of the cliff.

Find *h*, the height of the cliff, correct to the nearest metre.

6. **(a)** A factory produces a range of wigs, as follows:
- The wigs can have either short hair or long hair.
- The colour can be blond or black or red.
- The hair can either be straight or curly.

How many different wigs in this range can the factory produce?

(b) A bag contains 5 apples, 4 pears, 3 oranges and 2 bananas.
A child chooses a piece of fruit at random from the bag.

Find the probability that the fruit chosen is
(i) a pear
(ii) an orange
(iii) an apple or an orange
(iv) not a banana.

(c) The table below shows how a class of 90 students normally travel to school.

	Walk	Car	Bus
Girls	9	15	21
Boys	10	16	19

A student is chosen at random. What is the probability that the student
(i) is a boy who comes to school by bus
(ii) is a girl
(iii) travels to school by car
(iv) does not walk to school.

7. **(a)** Find the mode of the numbers

$$3, \ 2, \ 2, \ 3, \ 1, \ 3.$$

(b) The table below shows the time taken by 60 people to get ready for work in the morning, correct to the nearest minute.

Number of minutes	0 – 15	16 – 30	31 – 45	46 – 60	61 – 75
Number of people	3	15	26	14	2

Copy and complete the cumulative frequency table.

Number of minutes	≤ 15	≤ 30	≤ 45	≤ 60	≤ 75
Number of people					

Draw the cumulative frequency curve. Use your curve to estimate

(i) the median number of minutes taken to get ready

(ii) the number of people who took more than 20 minutes to get ready.

(c) **(i)** Find the mean of the numbers 3, 4, 6, 8, 9.

(ii) Find the standard deviation of the numbers 3, 4, 6, 8, 9, correct to two decimal places.

8. **(a)** Construct a triangle *xyz* where
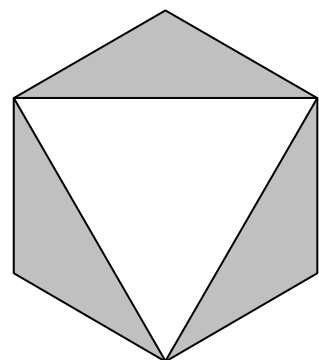$|xy|$ = 7 cm, $|yz|$ = 5 cm, $|\angle xyz|$ = 30º.

(b) The rectangle *ab′c′d′* is an enlargement of the rectangle *abcd*.
The centre of the enlargement is *a*.
$|dc|$ = 4 cm, $|bc|$ = 3 cm, $|d′c′|$ = 10 cm.
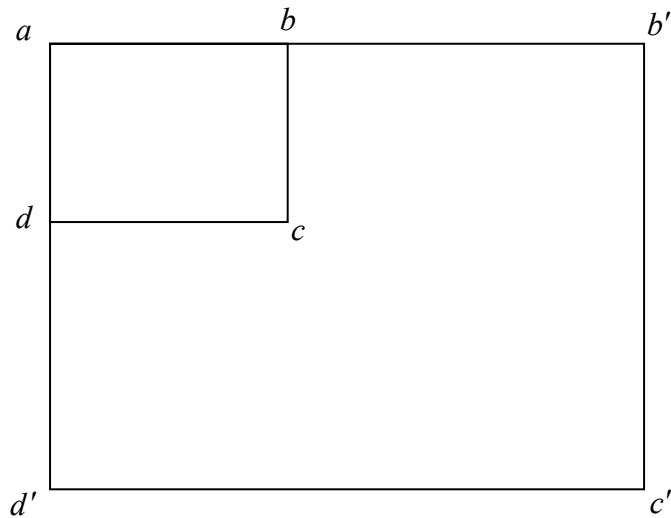
(i) Find the scale factor.

(ii) Find the length of [*b′c′*].

(iii) Find the length of [*bb′*]

(iv) Find the area of the rectangle *ab′c′d′*.

(c) The diagram shows a patterned hexagonal tile.

(i) State whether the tile has a central symmetry (that is, a point symmetry).

(ii) How many axial symmetries does the tile have?

(iii) How many rotational symmetries does the tile have?

(iv) List the angles of the rotational symmetries.

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