Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2004

MATHEMATICS — FOUNDATION LEVEL
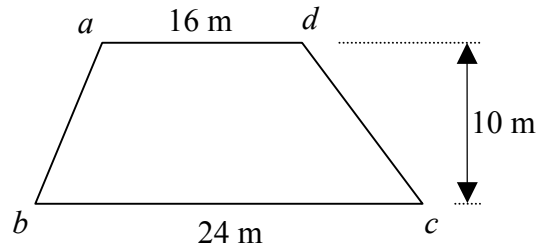
PAPER 2 (300 marks)

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

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.

1. **(a)** Find the area of the trapezium shown.

a 16 m d

10 m

b 24 m c

(b) A garden has one irregular side. Offsets of lengths 18, 12, 14, 17, 15, 21, and 23 metres are measured from the irregular side to the opposite side, as shown. The offsets are 9 metres apart.
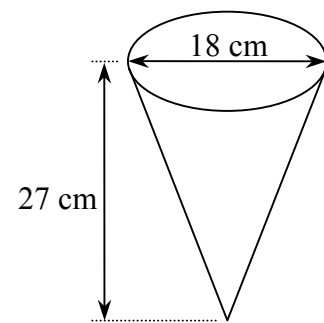
18   12   14   17   15   21   23

9
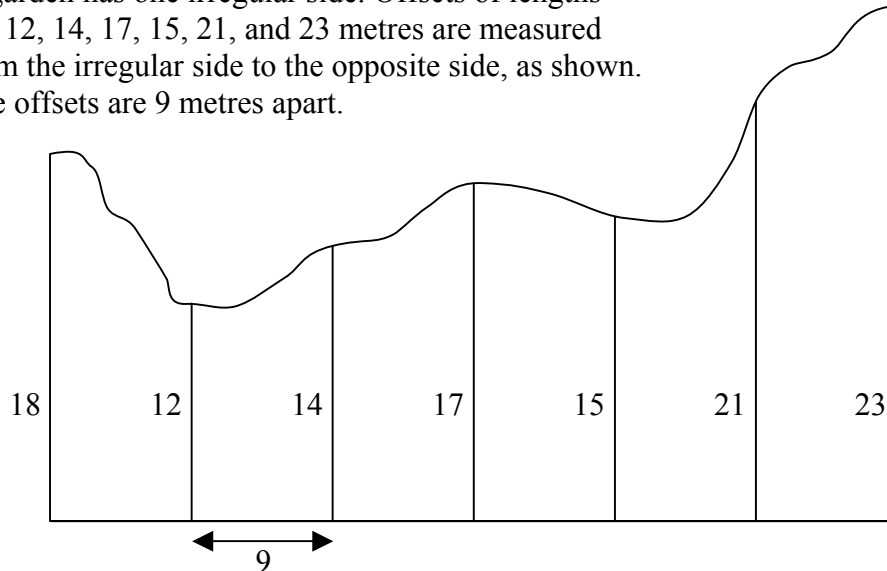
Calculate the area of the garden using Simpson's Rule.

2. **(a)** A disc has a diameter of 12 cm.
     (i) Write down the radius of the disc.
     (ii) Find the area of the disc, correct to the nearest cm^2.

12 cm
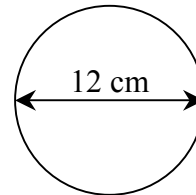
(b) A container in the shape of an inverted cone is filled with orange juice. The diameter of the cone is 18 cm and the height is 27 cm.

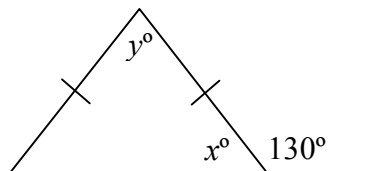   **(i)** Find the volume of orange juice in the container, in terms of π.

18 cm

27 cm

     (ii) The orange juice is then poured into a cylindrical can of diameter 12 cm. Find h, the depth of the orange juice in the can.

12 cm

h
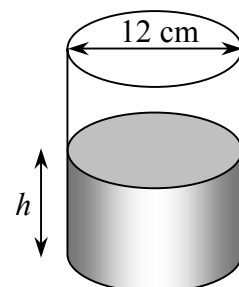
3. **(a)** The diagram shows an isosceles triangle.
  (i) Find the value of x.
  (ii) Find the value of y.
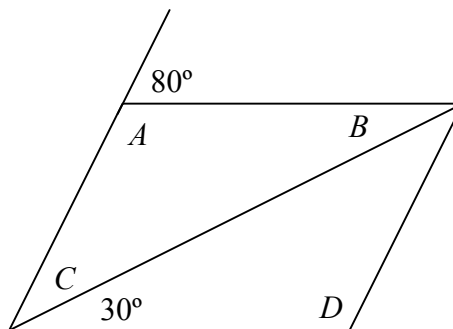
(b) The diagram shows a parallelogram.

Find the measure of:

  (i) the angle A
  (ii) the angle B
  (iii) the angle C
  (iv) the angle D

(c) o is the centre of the circle,
[pt] is a diameter of the circle and r is a point on the circle.
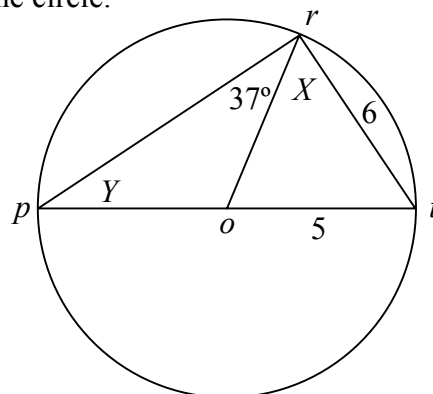$|\angle pro| = 37°$, $|rt| = 6$ cm and $|ot| = 5$ cm.

Find:

  (i) the measure of the angle X
  (ii) the measure of the angle Y
  (iii) the length of the diameter [pt]
  (iv) the length of [pr].

4. **(a)** $p(3, 6)$ and $q(-3, -2)$ are two points.
Find the length of [pq].

(b) $a(-1, 3)$ and $b(3, 5)$ are two points.

  (i) Plot the points a and b on graph paper.
  (ii) Write down the co-ordinates of the midpoint of [ab].
  (iii) Find the slope of ab.
  (iv) Find the equation of the line ab.

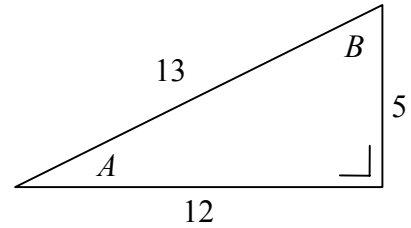**(c)** The line L has equation $4x + y - 7 = 0$.
k is the point $(2, -1)$.

  (i) Show that the point k lies on the line L.
  (ii) Write down the slope of the line L.
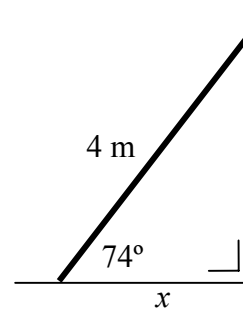 **(iii)** Find the equation of the line through point $k(2, -1)$ which is perpendicular to the line L.

5. **(a)** The diagram shows a right-angled triangle
with sides of length 5, 12 and 13 cm and
angles named *A* and *B*.

    (i)   Write down sin*A* as a fraction.
    (ii)   Write down cos*B* as a fraction.

(b) A ladder leans against a wall. The ladder is
4 m long and makes an angle of 74° with the
ground.

Find *x*, the distance from the base of
the wall to the foot of the ladder.
Give your answer correct to one decimal place.

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

    (ii)   Find the measure of the angle *A*.
    Give your answer to the nearest degree.
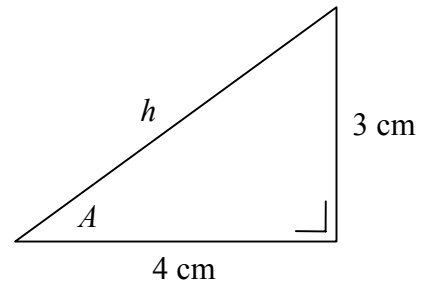
6. **(a)** Lunch in a certain hotel consists of a main course and a dessert. There are five
different main courses and three different desserts. How many different lunch
selections are possible?

(b) A student has 15 homework copies in her bag. Eight of these are red, four are green
and three are blue.

The student takes one copy at random from the bag. Find the probability that it is
(i)   a blue copy
(ii)   a green or a red copy
(iii) not a red copy.

(c) A school has two second-year classes: 2A and 2B. The table below shows the
number of boys and girls in these classes.

	2A	2B
Boys	10	15
Girls	14	11

(i)   How many second-year students are there in the school?

One second-year student is chosen at random.
Find the probability that the student

(ii)   is a boy in 2A
(iii) is not a boy in 2A
(iv) is a girl.

7. **(a)** Find the mean of the five numbers 6, 8, 12, 15, 19.

(b) The table below is a record of the number of days each of 80 students was absent during a school year.

Number of days absent	0 – 5	6 – 10	11 – 15	16 – 20	21 – 25
Number of students	8	12	30	24	6

Copy and complete the following cumulative frequency table.

Number of days absent	≤5	≤10	≤15	≤20	≤25
Number of students					

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

Use your curve to estimate
(i) the median number of days absent
(ii) the number of students who missed more than 18 days.

(c) Find the mean and the standard deviation of the numbers
    4, 6, 11, 15,
correct to two decimal places.

8. **(a)** Construct a rectangle *abcd* where
$|ab| = 7$ cm and $|bc| = 4$ cm.

(b) The triangle *a'b'c'* is the image of the triangle *abc* under an enlargement with centre at *o*.

$|ac| = 5$ cm, $|ab| = 4$ cm, $|a'c'| = 10$ cm

and $|b'c'| = 6$ cm.
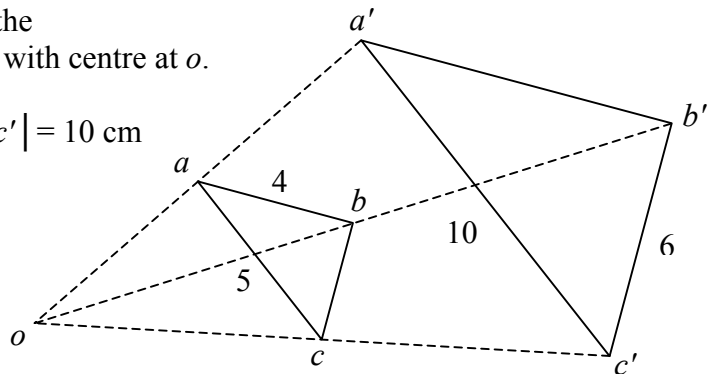
(i) Find the scale factor.
(ii) Find the length of [*a'b'*].
(iii) Find the length of [*bc*].
(iv) The area of the triangle *abc* is 6 cm². Find the area of the triangle *a'b'c'*.

(c) Construct any triangle in your answerbook. Construct the circumscribed circle of the triangle. Show all construction lines clearly.

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