



**Coimisiún na Scrúduithe Stáit
State Examinations Commission**

LEAVING CERTIFICATE EXAMINATION, 2003

MATHEMATICS - FOUNDATION LEVEL

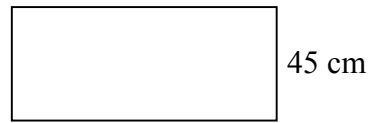
PAPER 2 (300 marks)

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

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

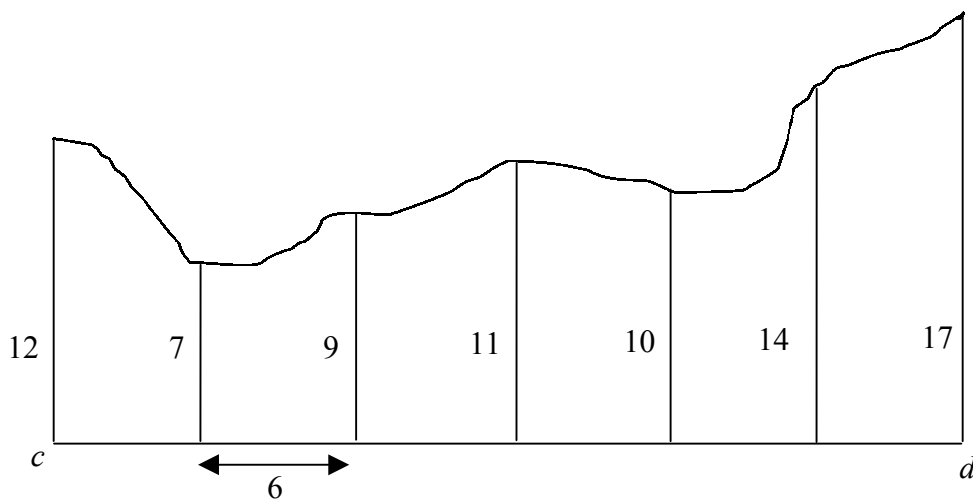
**Marks may be lost if necessary work is not clearly shown.
A sheet of formulae will be given to you by the Superintendent.**

1. (a) A wire of length 3 metres is bent to form a rectangle, one side of which is 45 cm.



Calculate the length of the longer side and hence calculate the area enclosed by the rectangle.

- (b) A road has a straight edge cd . The diagram below shows a section of the road that is covered by a flood.



Offsets of lengths 12, 7, 9, 11, 10, 14 and 17 metres are measured at intervals of 6 metres along $[cd]$. Calculate the area of the flooded section using Simpson's Rule.

2. (a) A sphere and a cylinder have the same volume. The sphere has radius 6 cm.

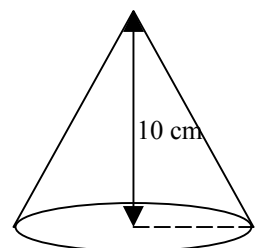
(i) Calculate the volume of the sphere.

The radius of the cylinder is 4 cm.

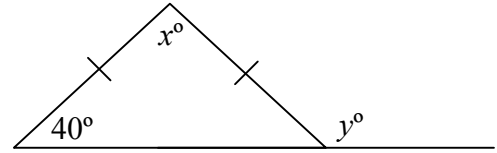
(ii) Calculate the height of the cylinder.

Take $\pi = 3.14$.

- (b) The volume of a right circular cone is 3246 cm^3 . The height of the cone is 10 cm. Calculate the radius of the base, correct to one decimal place. Take $\pi = 3.14$.



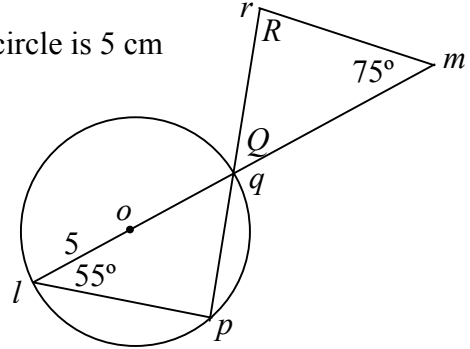
3. (a) The diagram shows an isosceles triangle. Find the value of x and the value of y .



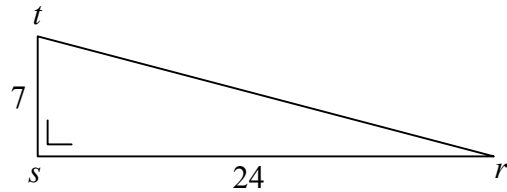
- (b) o is the centre of the circle. The radius of the circle is 5 cm and $|lq| = |qm|$.

Find:

- (i) the measure of the angle P
- (ii) the measure of the angle Q
- (iii) the measure of the angle R
- (iv) the length of $[qm]$.



- (c) The diagram shows a right-angled triangle with $|rs| = 24$ and $|st| = 7$. Use the theorem of Pythagoras to find $|rt|$.



4. (a) $p(1, 8)$ and $q(3, -8)$ are two points. Find the slope of pq .

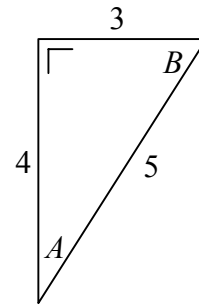
- (b) a is the point $(2, 5)$ and b is the point $(-3, 6)$.

- (i) Find the length of $[ab]$.
- (ii) Find the co-ordinates of the midpoint of $[ab]$.
- (iii) Plot the points a and b and the midpoint of $[ab]$ on graph paper.

- (c) The line L has equation $4y = 3x + 20$. The point c has co-ordinates $(0, 5)$.

- (i) Show that the point c lies on the line L .
- (ii) Write down the slope of L .
- (iii) Find the equation of the line M , which passes through the point $(-2, 3)$ and is parallel to L .

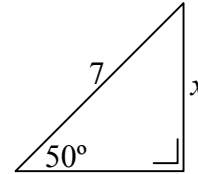
5. (a) The diagram shows a right-angled triangle with sides of length 3, 4 and 5 cm and angles named A and B .



Write down the value of:

- (i) $\cos A$
 (ii) $\sin A$
 (iii) $\tan B$.

- (b) Calculate the value of x , to one decimal place.

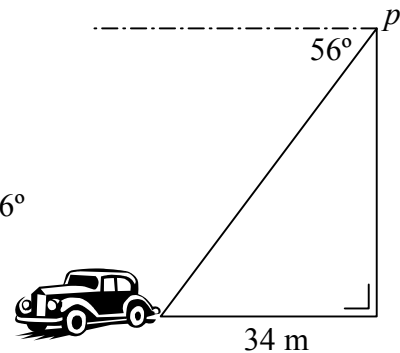


- (c) A car is on level ground 34 m from the foot of a hotel.

The point p is at the top of the hotel.

To see the car from p , a person must look down 56° from the horizontal.

Calculate the height of p above ground level, correct to the nearest metre.



6. (a) Of the people working in a factory 20 walk to work, 10 go by car and the remaining 25 go by bus.

One of the people working in the factory is chosen at random. What is the probability that this person goes to work by bus?

- (b) A young person starting a new job needs an outfit, consisting of a jacket, trousers and shirt. A local shop stocks the following:
 three different types of jacket
 two different types of trousers
 five different types of shirt.

How many different selections of outfit are possible?

- (c) 150 students sitting an examination were grouped according to age (16, 17 or 18), and gender (female or male). The results are given in the following table:

	Age 16	Age 17	Age 18
Female	23	30	21
Male	10	50	16

One student is chosen at random.

What is the probability that the student is

- (i) male
 (ii) a 16 year old female
 (iii) younger than 18?

7. (a) The mean of the five numbers 4, 8, y , 12, 15 is 9.
Find the value of y .
- (b) The following table is a record of the time taken by employees to travel to work:

Time Taken (in minutes)	5 – 15	15 – 25	25 – 35	35 – 45
Number of Employees	4	31	45	25

Note: 5 – 15 means 5 minutes or more but less than 15 minutes, etc.

Copy and complete the cumulative frequency table below.



Time Taken (in minutes)	<5	<15	<25	<35	<45
Number of Employees	0				

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

Use your curve to estimate the median amount of time taken.

- (c) Find the mean and the standard deviation of the numbers
5, 7, 12, 16,
correct to two places of decimals.
8. (a) Construct a triangle abc with
 $|ac| = 10$ cm, $|bc| = 8$ cm and $|ab| = 6$ cm.
What is the measure of the angle abc ?
- (b) Construct a square $abcd$, with $|ab| = 4$ cm.
Draw the image of the square under the enlargement
with centre a and scale factor 2.5.
Find the area of the enlarged square.
- (c) A rectangular map is reduced by a scale factor of 0.5.
Two towns were 9 cm apart on the original map.
How far apart are they on the reduced map?
- The original map had an area of 350 cm².
Find the area of the reduced map.