FOR THE EXAMINER

EXAM. NUMBER:

Total Marks:

Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2008

MATHEMATICS - ORDINARY LEVEL - PAPER 2 (300 marks)

MONDAY, 9 JUNE - MORNING, 9:30 to 11:30

Time: 2 hours

Attempt **ALL** questions. Each question carries 50 marks.

Answers and supporting work should be written into the boxes provided.

Extra paper and graph paper can be obtained from the Superintendent, if needed.

The symbol ✍ indicates that supporting work must be shown to obtain full marks.

Make and model of calculator used:

For Superintendent/Examiner use only:

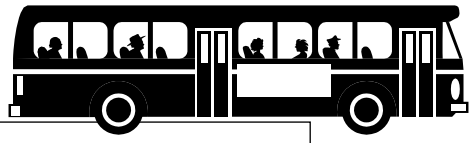
Centre Stamp

Question	Mark
1	
2	
3	
4	
5	
6	
Total	
Grade	

1. **(a)** Add 430 cm to 179 cm and give your answer in metres.

1(b) A bus leaves Sligo at 11:45 and arrives in Derry at 14:15.

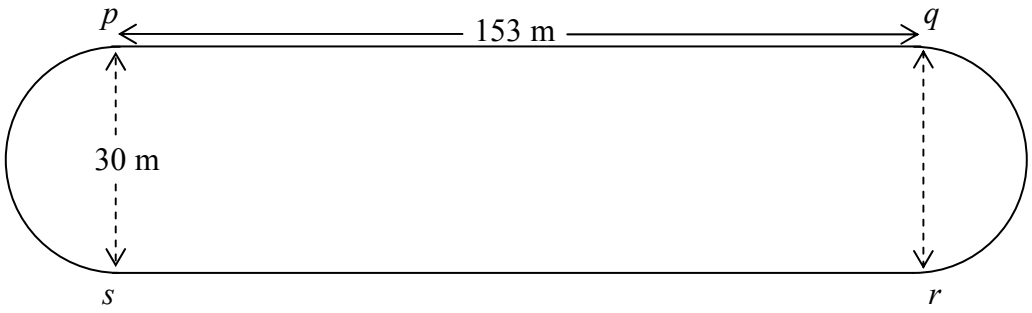
(i) How long does the bus journey take?
Give your answer in hours and minutes.



(ii) The bus travels a distance of 135 km.
Calculate the average speed, in km/h, for the journey from Sligo to Derry.

(iii) The bus uses 1 litre of diesel for every 4·5 km travelled.
On a particular day, diesel cost 115·9 cent per litre.
Find the cost of the diesel used by the bus on that day
for the journey from Sligo to Derry.
Give your answer correct to the nearest euro.

1 (c) An athletics track has two equal parallel sides $[pq]$ and $[sr]$ and two equal semi-circular ends with diameters $[ps]$ and $[qr]$.
$|pq| = |sr| = 153$ metres, and $|ps| = |qr| = 30$ metres.

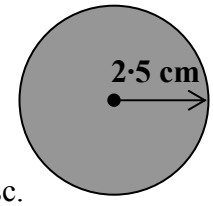


(i) Taking π as $3 \cdot 14$, calculate the length of one of the semi-circular ends, correct to the nearest metre.

(ii) Calculate the total length of one lap of the track, correct to the nearest metre.

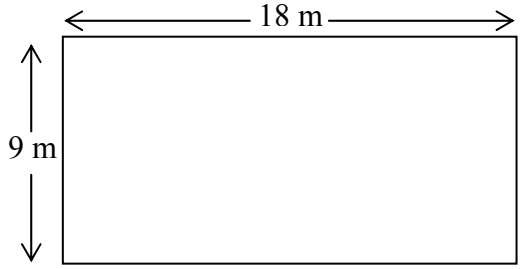
(iii) Noirín ran a 5000 metre race on the above track in 15 minutes. Calculate, in seconds, the average time it took Noirín to complete one lap of the track during that race.

2. **(a)** A disc has a radius of 2·5 cm.



Taking π as 3·14, calculate, in cm^2, the area of the disc.

2(b) A rectangular garden has measurements as shown.

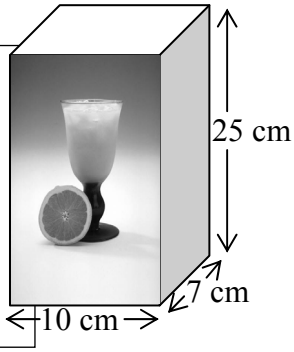


(i) Find, in m^2, the area of the garden.

(ii) The garden is to be covered completely with square concrete slabs each of side 50 cm.
Find the number of slabs required to cover the garden.

2(c) **(i)** A rectangular carton full of orange juice measures 10 cm by 7 cm by 25 cm.

Find, in cm^3, the volume of orange juice in the carton.



(ii) The orange juice fills 14 cylindrical glasses exactly.

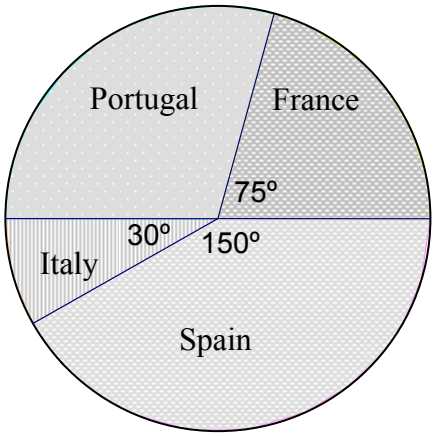
Find, in cm^3, the volume of each glass.

(iii) The radius of each glass is 2·4 cm. Taking π as 3·14, calculate the height of each glass, correct to the nearest cm.

3. **(a)** Find the mode of the numbers: 11, 6, 8, 6, 11, 4, 6, 3, 8.

Mode =

3(b) A group of people was surveyed to find which country was their preferred holiday destination. The pie chart represents the result of that survey.



(i) What is the measure of the angle for Portugal?

(ii) 10 people replied that Italy was their favourite holiday destination. How many people were surveyed?

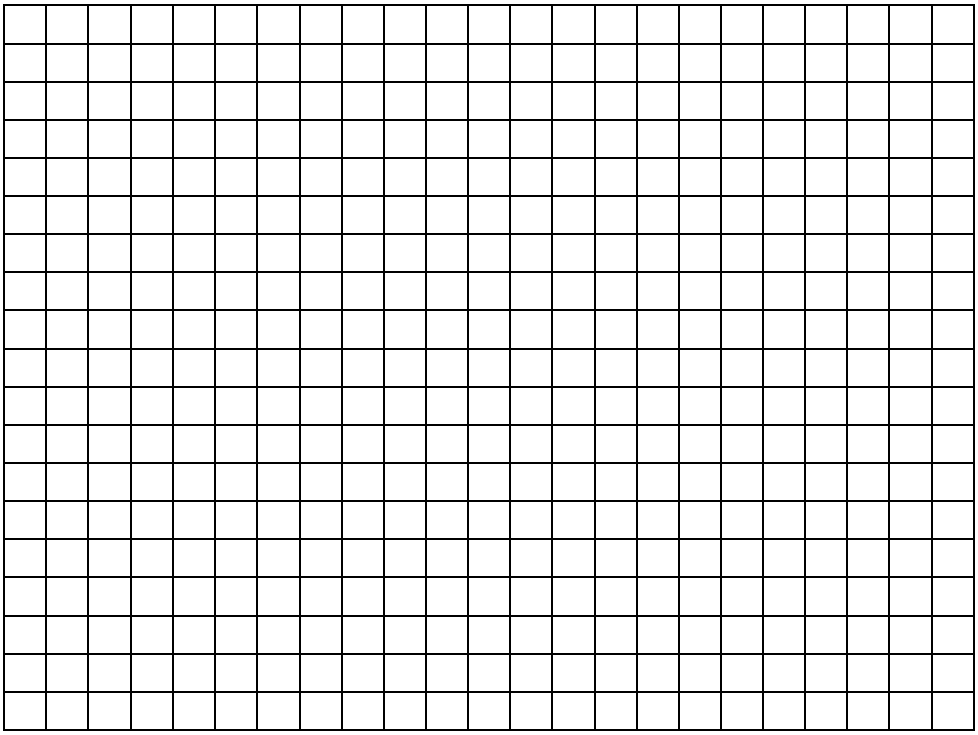
(iii) How many gave Spain as their reply?

3(c) At the end of a month 50 students wrote down the number of days they were absent from school during that particular month.

The results are shown in the following table:

Number of days absent	0	1	2	3	4	5
Number of students	12	7	12	10	6	3

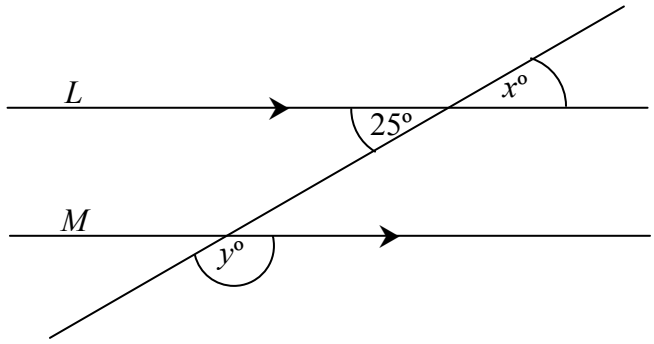
(i) Draw a bar chart of the data.



(ii) Find the mean number of days absent per student.

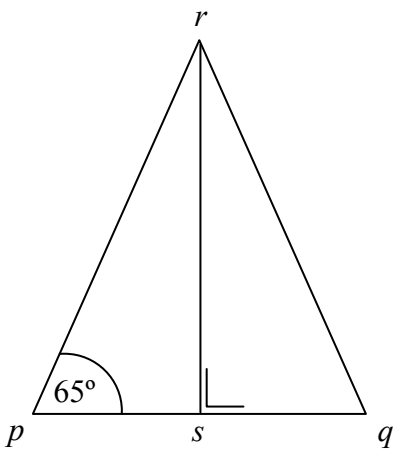
(iii) Find the percentage of students who were absent for three or more days.

4. **(a)** L and M are parallel lines.
Find the value of x and the value of y in the diagram.



x = y =

4(b) pqr is an isosceles triangle with $|rp| = |rq|$, $rs \perp pq$ and $|\angle rpq| = 65°$.



(i) Find $|\angle pqr|$ and give a reason for your answer.

$|\angle pqr| =$

Reason:

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

$|\angle prq| =$

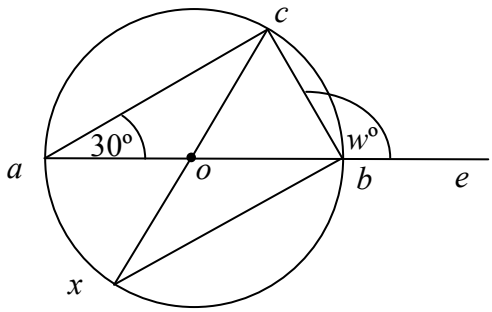
(iii) Given that $|pq| = 5{\cdot}8$ cm and $|rs| = 6{\cdot}2$ cm,
find the area of the $\Delta\, pqr$ in cm^2.

(iv) Show that $\Delta\, prs$ and $\Delta\, qrs$ are congruent.

Reasons:

Part (c) on next page

4(c) a, b, c and x are points on a circle with centre o as shown. $|\angle bac| = 30°$, $|\angle cbe| = w°$.

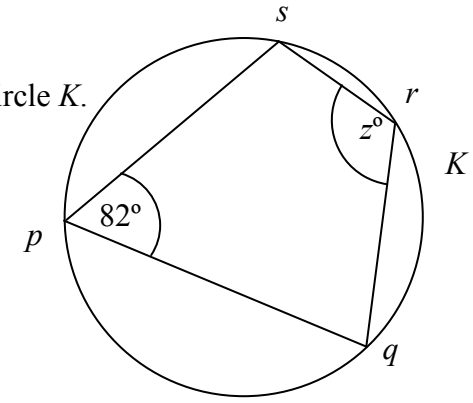


(i) Name the image of $\Delta\, aoc$ under S_o, the central symmetry in o.

(ii) Find the value of w.

$w =$

(iii) $pqrs$ is a cyclic quadrilateral of the circle K. $|\angle spq| = 82°$ and $|\angle srq| = z°$.

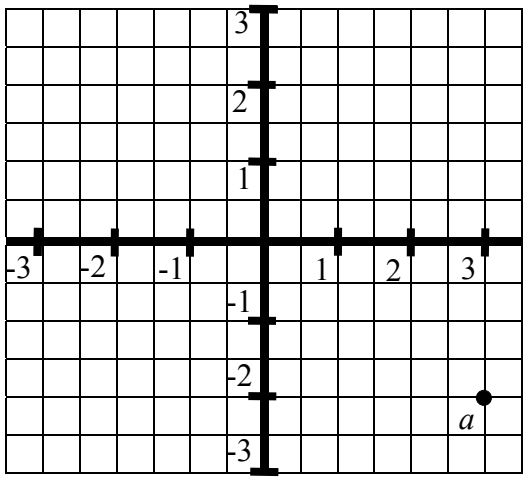


Find the value of z.

$z =$

5. *Note: Coordinate Geometry Formulae are given on Page 13.*

(a) Write down the coordinates of the point a.



a =

(b) p is the point (1, 2) and q is the point (5, -8). Find each of the following:

(i) the midpoint of $[pq]$

(ii) the slope of pq

(iii) the length of $[pq]$.

If you wish to draw a diagram, use the next page.

5(c) **(i)** The line L contains the point (2, 1).
L has a slope of 3.
Find the equation of L.

(ii) By letting $y = 0$, find the coordinates of p, the point of intersection of the line L and the x-axis.

Formulae

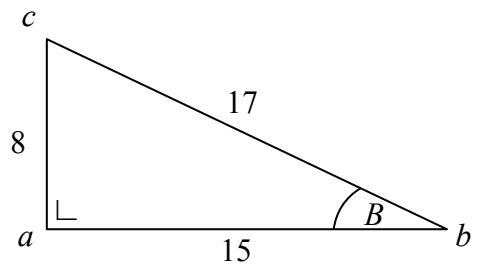
Midpoint of a line segment : $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

Slope of a line: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Length of a line segment: $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Equation of a line: $y - y_1 = m(x - x_1)$

6. **(a)** The right-angled triangle *abc* has measurements as shown.



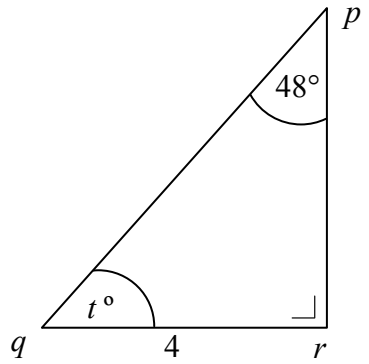
(i) Write down the length of the hypotenuse of the Δabc.

Length of the hypotenuse of the Δabc =

(ii) Write down the value of sin B, as a fraction.

sin B =

6(b) In the right-angled triangle *pqr*,
$|qr| = 4$, $|\angle qpr| = 48°$ and $|\angle pqr| = t°$.



(i) Find the value of t.

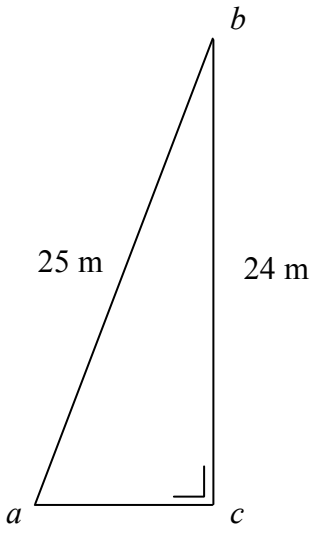
t =

(ii) Using your calculator, or otherwise, write down the value of tan $\angle pqr$ correct to one decimal place .

tan $\angle pqr$ =

(iii) Hence, or otherwise, calculate $|pr|$ correct to one decimal place.

6 (c) In the Δabc, $|\angle bca| = 90°$, $|ab| = 25$ m and $|bc| = 24$ m.



(i) Find, in metres, $|ac|$.

(ii) Find $|\angle bac|$, correct to the nearest degree.

Space for extra work