AN ROINN OIDEACHAIS S 33

JUNIOR CERTIFICATE EXAMINATION, 1992

33277

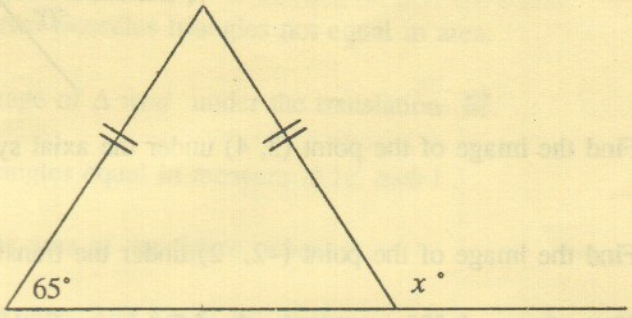
MATHEMATICS - ORDINARY LEVEL - PAPER 2 (300 marks)

FRIDAY, 12th JUNE, MORNING - 9.30 to 12.00.

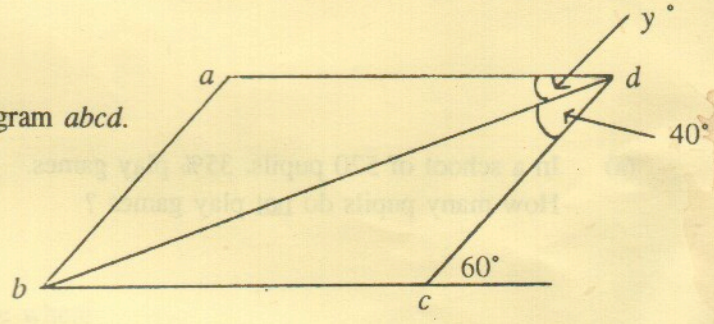
Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each).
Marks may be lost if all your work is not clearly shown .
Mathematics Tables may be obtained from the Superintendent .

1. **(i)** Two angles of a triangle measure 47° 50′ and 62° 40′.
Calculate the measure of the third angle.

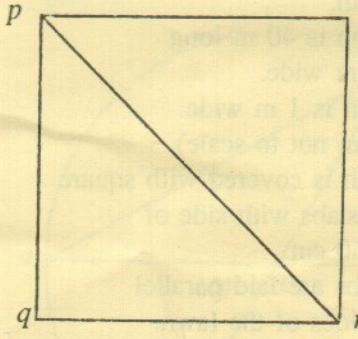
(ii) Calculate the value of x.



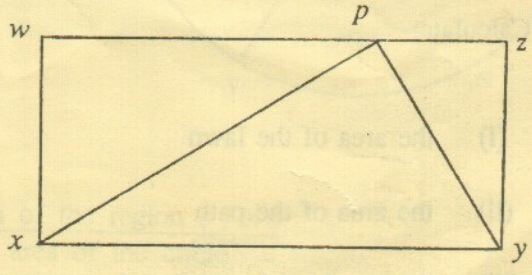
(iii) [bd] is a diagonal of the parallelogram $abcd$.
Calculate the value of y.



(iv) $pqrs$ is a square and $|pr| = \sqrt{8}$.
Calculate the length of a side of the square.



(v) The area of the $\Delta\, pxy$ is 12.
Find the area of the rectangle $wxyz$.



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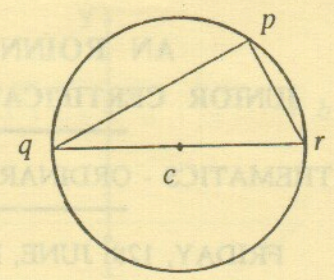
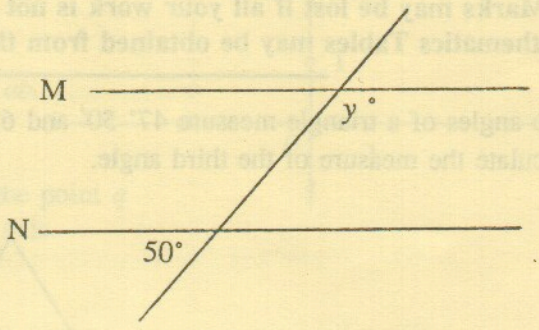
(vi) In the circle with centre c and of radius 2·5 cm,



$|pq| = 4$ cm.

Calculate $|pr|$.

(vii) M and N are parallel lines.



Calculate the value of y.

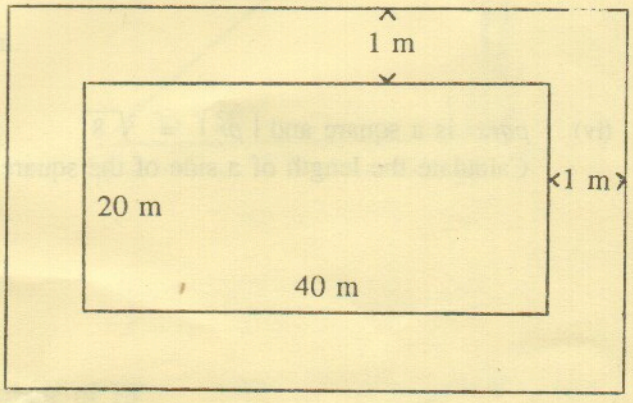
(viii) Find the image of the point (3, 4) under the axial symmetry in the Y axis.

(ix) Find the image of the point (–2, 2) under the translation $(0, 0) \rightarrow (7, 4)$.

(x) If $\cos \theta = 0{\cdot}585$, use the book of Tables to find the value of $\sin \theta$.

2. **(a)** In a school of 520 pupils, 35% play games.
How many pupils do <u>not</u> play games ?

(b) A rectangular lawn is surrounded by a path.
The lawn is 40 m long and 20 m wide.
The path is 1 m wide.
(Diagram not to scale).
The path is covered with square paving slabs with side of length 50 cm.
The slabs are laid parallel to the sides of the lawn.



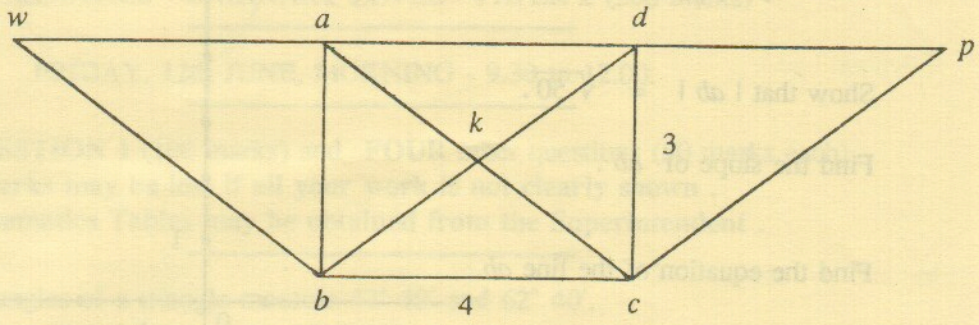
Calculate:

(i) the area of the lawn

(ii) the area of the path

(iii) the number of paving slabs required to cover the path.

3. *abcd* is a rectangle having diagonals intersecting at *k*.
awbc and *pdbc* are parallelograms.
$|bc| = 4$ and $|dc| = 3$.



(i) Name any two isosceles triangles not equal in area.

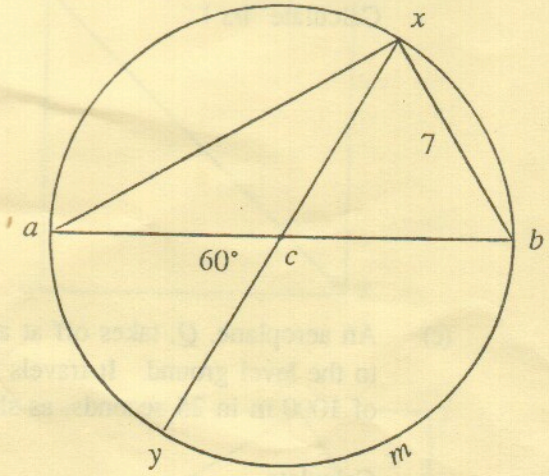
(ii) Find the image of $\Delta\, wbd$ under the translation $\overrightarrow{bc}$.

(iii) Name two angles equal in measure to $|\angle\, awb|$.

(iv) Calculate the area of the figure *wbcp*.

(v) Prove that $\Delta\, awb$ and $\Delta\, pdc$ are congruent.

4. *c* is the centre of the circle where
$|\angle\, acy| = 60°$ and $|xb| = 7$.



(i) Find the image of $\Delta\, xcb$ under the central symmetry in *c*.

(ii) Find $|\angle\, axc|$.

(iii) Name two angles equal in measure to $|\angle\, acy|$.

(iv) Calculate $|ab|$.

(v) Using angles, find the ratio:

$$\frac{\text{area of the region } c\,y\,m\,b}{\text{area of the circle}}$$

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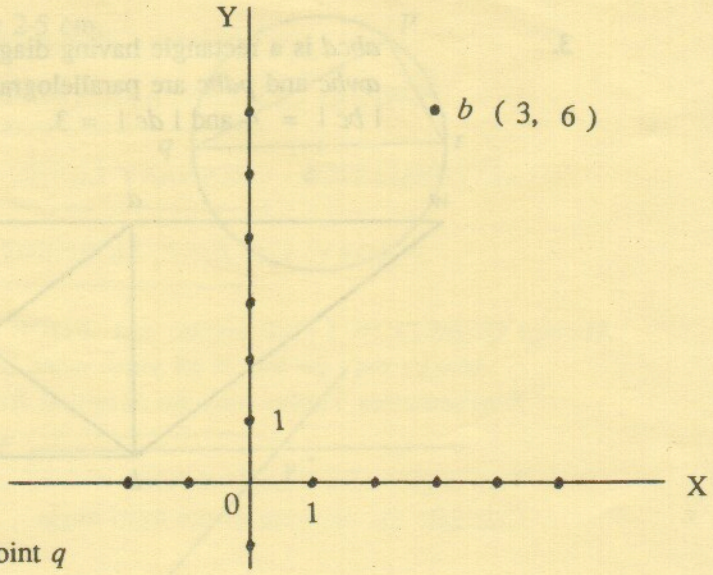
5. b (3, 6) is a point, as in diagram.



Plot the point a (– 2, 1).

Show that $|ab| = \sqrt{50}$.

Find the slope of ab.

Find the equation of the line ab.

Calculate the coordinates of the point q where the line ab cuts the X axis.

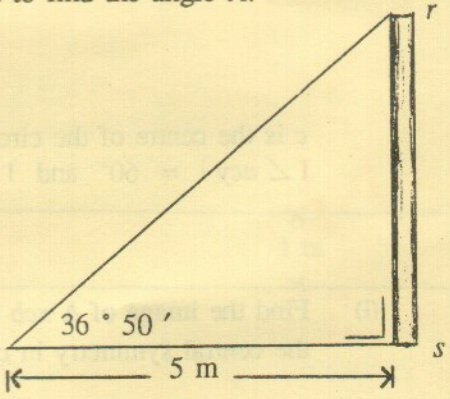
[Distance formula : $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Slope formula : $\frac{y_2 - y_1}{x_2 - x_1}$

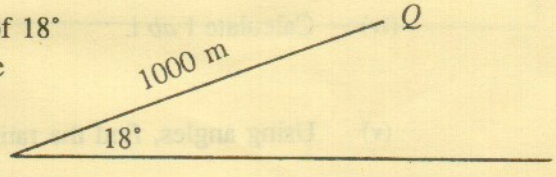
Equation of line : $y - y_1 = m(x - x_1)$ OR $y = mx + c$]

6. **(a)** If tan A = 0·749, use the book of Tables to find the angle A.

(b) When the angle of elevation of the sun is 36 ° 50 ′ , an upright pole, $[rs]$, casts a shadow of length 5 m. Calculate $|rs|$.



(c) An aeroplane, Q, takes off at an angle of 18° to the level ground. It travels a distance of 1000 m in 25 seconds, as shown.



Calculate

(i) the average speed of Q in m/s.

(ii) the height of Q above the ground after 25 seconds.