

MATHEMATICS - ORDINARY LEVEL - PAPER 2 (300 marks)

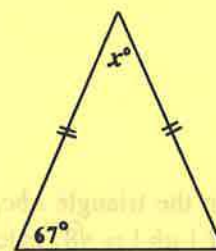
FRIDAY, 13th JUNE, MORNING - 9.30 to 12.00.

7938

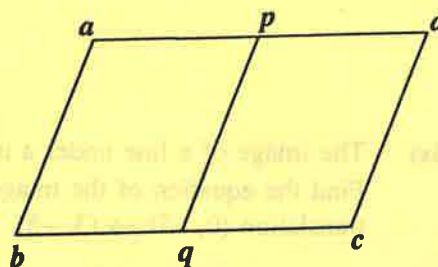
Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each).
Marks may be lost if necessary work is not clearly shown.
Mathematics Tables may be obtained from the Superintendent.

1. (i) Add $42^\circ 52'$ and $18^\circ 28'$.

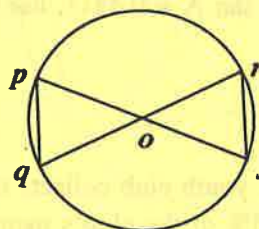
- (ii) Calculate the value of x in the diagram.



- (iii) $abcd$ is a parallelogram and $pq \parallel ab$.
 Name two angles each having the same measure as $\angle abc$.

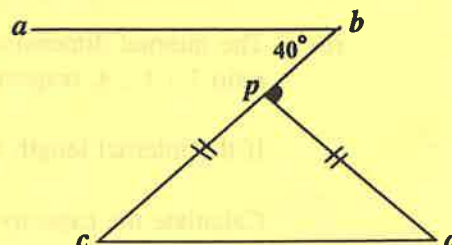


- (iv) $[ps]$ and $[qr]$ are diameters of the circle with centre o .
 Find the image of $[pq]$ under the central symmetry in the point o .

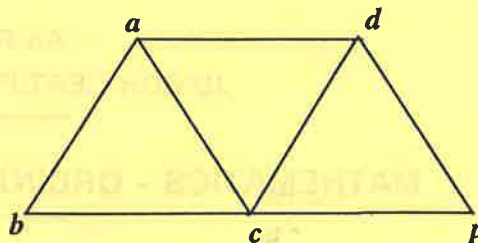


- (v) $ab \parallel cd$, $|\angle abc| = 40^\circ$
 and $|pc| = |pd|$.

Name another angle which measures 40° .
 Hence, calculate $|\angle bpd|$.

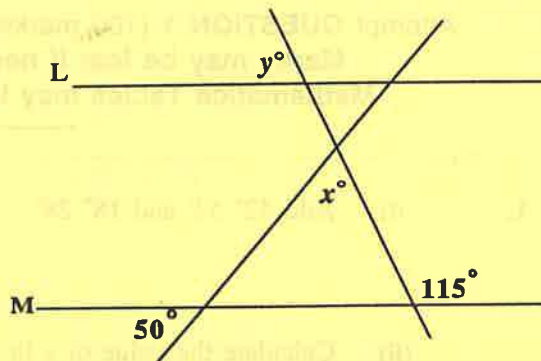


- (vi) $abcd$ and $acpd$ are parallelograms.
Under the translation \vec{bc} ,
write down the image of

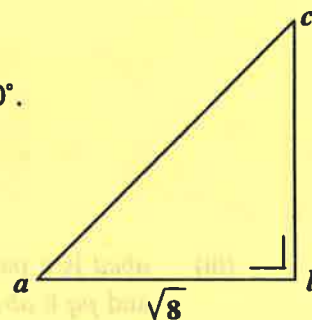


- (i) triangle abc
(ii) $[ac]$.

- (vii) L and M are parallel lines.
Find the value of x and the
value of y .



- (viii) In the triangle abc , $|ab| = |bc|$ and $|\angle abc| = 90^\circ$.
If $|ab| = \sqrt{8}$, calculate $|ac|$.



- (ix) The image of a line under a translation is a parallel line.
Find the equation of the image of the line $y = 3x - 5$ under the
translation $(0, -5) \rightarrow (3, -5)$.

[Equation of line is $y - y_1 = m(x - x_1)$ or $y = mx + c$].

- (x) If $\tan A = 0.4411$, use the book of Tables to find $\cos A$.

2. (a) A youth club collects the same membership fee from each of its 140 members.
15% of the club's members have still to pay their membership fee.
How many club members have not paid their fee?

If the fees not yet paid amount to IR£50.40 in total, calculate the membership fee
for each club member.

- (b) The internal dimensions, length, width and height, of a rectangular box are in the
ratio $1 : 1 : 4$, respectively.

If the internal length of the box is 20 cm, find its width and height.

Calculate the capacity (internal volume) of the box in cm^3 .

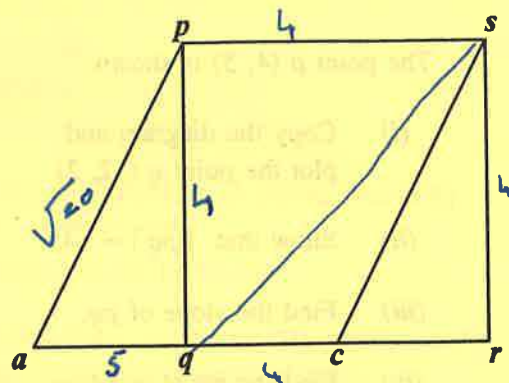
Spheres, each of radius length 5 cm, are packed into the box.

Calculate the maximum number of spheres that the box can contain.

9657
+ 9691
9712

3.

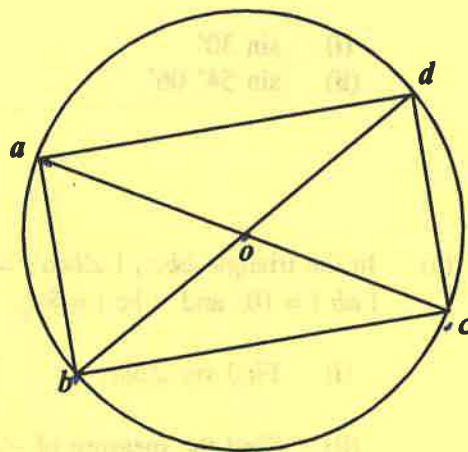
$pqrs$ is a square and
 $pacs$ is a parallelogram where
 $|aq| = |qc| = |cr|$.



- (i) Find the image of the triangle paq under the translation \vec{ac} .
- (ii) Name two line segments each equal in length to $[ac]$.
- (iii) If $|pq| = 4$, show that $|pa| = \sqrt{20}$.
- (iv) Calculate the area of the figure $pqcs$.
- (v) Prove that
 $|\angle scq| = |\angle apq| + |\angle pqa|$.

4.

Diameters $[ac]$ and $[bd]$ intersect at o , the centre of the circle.



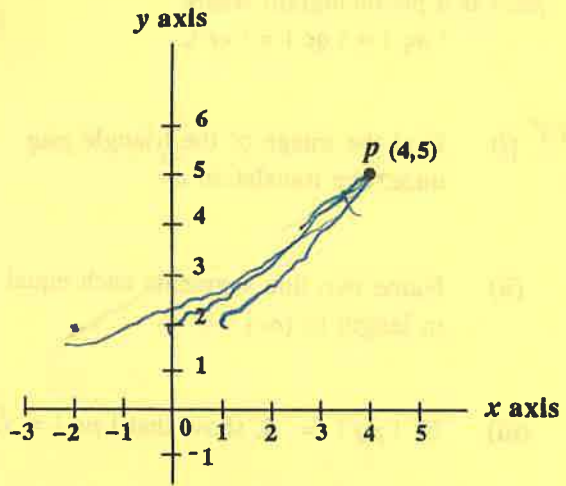
- (i) Name two angles each having the same measure as $\angle dao$.
- (ii) Find the image of the triangle abc under the central symmetry in the point o .
- (iii) Say why triangles aob and doc are congruent.
- (iv) If the area of the circle is 314, calculate its radius length, taking $\pi = 3.14$.
- (v) If $|\angle bao| = 60^\circ$, prove that $|ab| = |ob|$.

OVER →

5.

The point $p(4, 5)$ is shown.

- (i) Copy the diagram and plot the point $q(-2, 2)$.
- (ii) Show that $|pq| = \sqrt{45}$.
- (iii) Find the slope of pq .
- (iv) Find the equation of pq .
- (v) pq cuts the y axis at the point $d(0, y)$.
Calculate the value of y .
Hence, find the area of the triangle dpr , where r is the point $(0, 5)$.



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

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

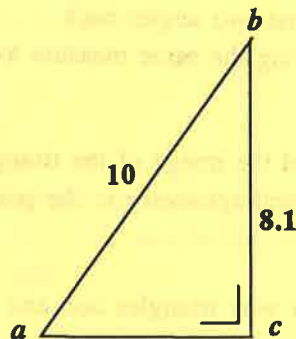
Equation of line: $y - y_1 = m(x - x_1)$ or $y = mx + c$].

6. (a) Use the book of Tables to find

- (i) $\sin 30^\circ$
- (ii) $\sin 54^\circ 06'$.

(b) In the triangle abc , $|\angle bca| = 90^\circ$,
 $|ab| = 10$ and $|bc| = 8.1$.

- (i) Find $\sin \angle bac$.
- (ii) Find the measure of $\angle abc$.
- (iii) Calculate $|ac|$, giving your answer correct to one place of decimals.



(c) [qr] and [mn] are two vertical poles standing on level ground pn .

$|\angle qpr| = 31^\circ 48'$ and $|pr| = 40$ m.

- (i) Calculate $|qr|$.
- (ii) If $|mn| = 31$ m, calculate $|rn|$.

