

INTERMEDIATE CERTIFICATE EXAMINATION, 1979

MATHEMATICS - LOWER COURSE - PAPER I (150 marks)

MONDAY, 11 JUNE - MORNING - 9.30 to 12.00

SECTION A (45 marks)

Examination Number

Attempt all questions. You should not spend more than 45 minutes on this section. Answer each question by writing one of (a), (b), (c), (d) in the box under each question number. If you wish to change an answer, cross out your first choice and write your new answer near the box. Mathematics tables may be obtained from the Superintendent.

THIS PAPER MUST BE ENCLOSED IN YOUR ANSWER BOOK

1. 0.47×0.8 is equal to

(a) 0.376

(b) 3.76

(c) 0.393

(d) 0.374

2. $(-2)^3$ is equal to

(a) -6

(b) 8

(c) -8

(d) $-\frac{3}{2}$

3. A person travels a distance of 24 km in 45 minutes. In 1 hour he would travel

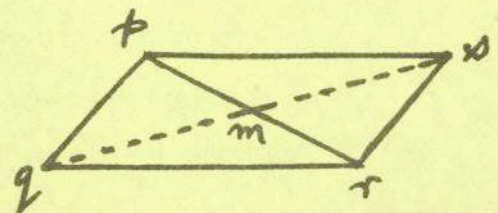
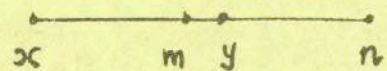
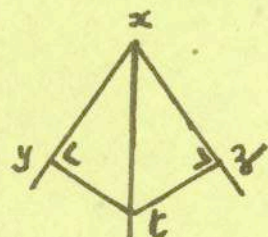
(a) 18 km

(b) 32 km

(c) 39 km

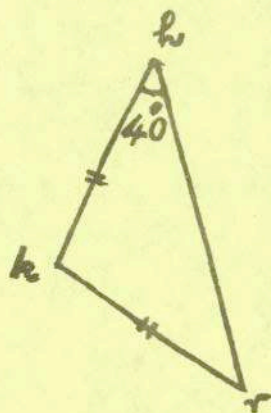
(d) $\frac{8}{15}$ km4. The area of a square is $2\frac{1}{4}$ cm². The length of one side in cm is
(a) $1\frac{1}{8}$ (b) $1\frac{1}{2}$ (c) $\frac{81}{16}$

(d) 6

5. The image of the couple (p, s) under the projection on pr parallel to qs is
(a) (p, m) (b) (m, r) (c) (p, r) (d) (m, p) 6. The translation \vec{xm} maps y to n . Which one of the following is false?
(a) $(x, m) \uparrow (y, n)$ (b) $(m, x) \uparrow (n, y)$ (c) $(x, m) \uparrow (m, n)$ (d) $(y, n) \uparrow (x, m)$ 7. xt is the bisector of the $\angle yxz$. Which one of the following is false?
(a) $|xz| = |xt|$ (b) $|tz| = |ty|$ (c) $|xy| = |xz|$ (d) $|\angle xtz| = |\angle xty|$ 

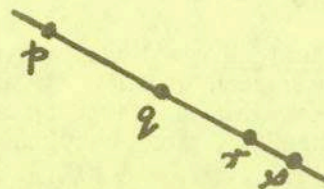
8. $|\angle hkr| =$

- (a) 140° (b) 50°
 (c) 80° (d) 100°



9. $[pr] \cap [sq] =$

- (a) $[qr]$ (b) $[ps]$
 (c) the null set (d) the line ps



10. An angle measures $(20.75)^\circ$. This is the same as

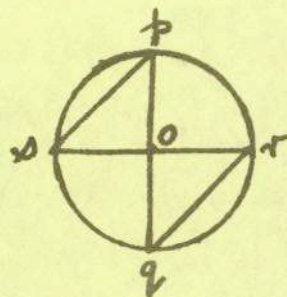
- (a) $20^\circ 45'$ (b) $21^\circ 45'$ (c) $21^\circ 15'$ (d) 95°

11. $\cos A = \frac{3}{5}$. Then A is

- (a) $53^\circ 4'$ (b) $53^\circ 8'$ (c) $36^\circ 52'$ (d) $36^\circ 56'$

12. $[pq]$ and $[rs]$ are two diameters which are perpendicular to each other. The Δpos is the image of the Δroq under

- (a) axial symmetry in pq (b) axial symmetry in rs
 (c) central symmetry in o (d) translation \vec{rp}



13. A triangle has angles measuring $30^\circ, 60^\circ, 90^\circ$. The triangle has at most

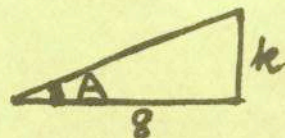
- (a) no axis of symmetry (b) one axis of symmetry
 (c) two axes of symmetry (d) three axes of symmetry

14. A chord of a circle is 5 cm from the centre of the circle. The radius of the circle is 13 cm. The length of the chord in cm is

- (a) 12 (b) 24 (c) 144 (d) 288

15. If $A = 21^\circ 48'$, then k is

- (a) 3.2 (b) 20 (c) 7.428 (d) 2.9712



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MATHEMATICS - LOWER COURSE - PAPER I (150 marks)

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SECTION B (105 marks)

Attempt **QUESTION 1** and **THREE** other questions

1. Use your tables, page 20 to page 27, or otherwise, to evaluate

(i) $85.61 + 0.078 + 3.2$

(ii) $(6.473)^2$, correct to 2 significant figures

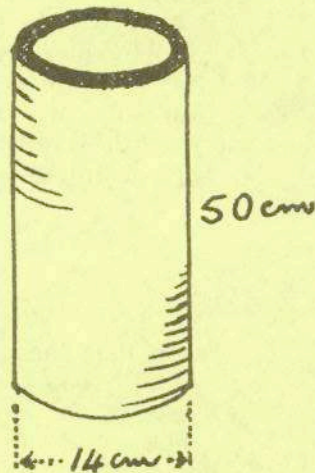
(iii) $\frac{1}{47.67}$, correct to 2 places of decimals

(iv) $\sqrt{0.9409}$, correct to 1 place of decimals

(25 marks)

2. The diameter of a cylindrical pipe is 14 cm and its length is 50 cm. Calculate its volume taking $\frac{22}{7}$ as an approximation for π .

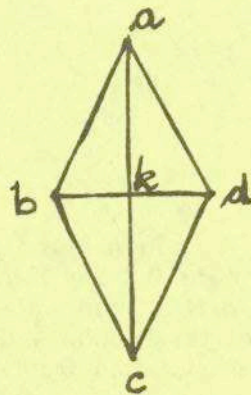
The external diameter of a cylindrical concrete pipe is 14 cm and its length is 50 cm. Calculate the volume of concrete in the pipe, if the pipe is 4 cm thick. Take $\frac{22}{7}$ as an approximation for π and give your answer correct to the nearest integer.



(20 marks)

3. $abcd$ is a parallelogram having its four sides equal in length.(i) (a, b) and (d, c) is a pair of equipollent couples. Name 4 other pairs of equipollent couples.

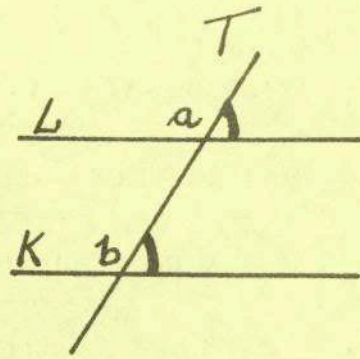
(ii) Name 4 isosceles triangles.

(iii) Name the image of $[ab]$ under the central symmetry in k .(iv) Name the image of $[ab]$ under the translation \vec{bc} .(v) Why is ac an axis of symmetry of $abcd$?

(20 marks)

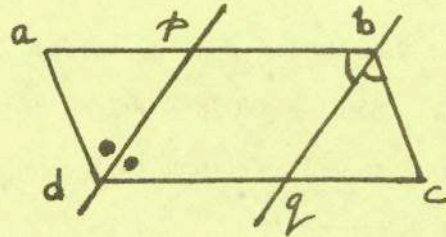
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4. $L \parallel K$ and T cuts them as in diagram.
 Prove that the corresponding angles (marked in diagram) are equal in measure.



$abcd$ is a parallelogram.
 dp bisects the $\angle adc$.
 bq bisects the $\angle abc$.

Prove $dp \parallel bq$.



(25 marks)

5. Using $[yz]$ as base construct a Δxyz given that
 $|yz| = 6 \text{ cm}$, $|\angle xyz| = 40^\circ$, area of $\Delta xyz = 18 \text{ cm}^2$.

Find by measurement $|\angle yxz|$ and $|xz|$.

Construct, without proof, the circumcircle of the triangle (i.e. the circle through x, y, z) and measure the radius as accurately as you can.

All construction lines must be clearly shown.

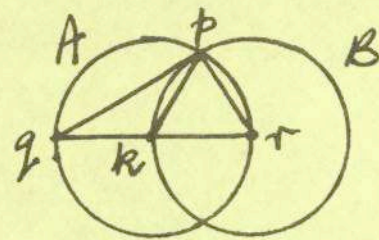
(25 marks)

6. Prove that the angle at a point of a circle standing on a diameter is a right angle.

A and B are two circles having radii of equal length.
 k and r are the centres of A and B , respectively.
 Prove

(i) Δpkr is equilateral

(ii) $|\angle qpk| = 30^\circ$.



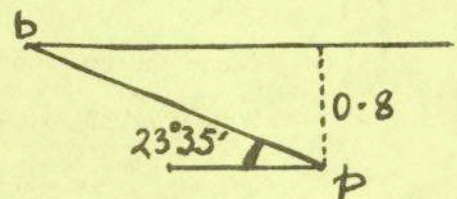
(25 marks)

7. A balloon b is travelling due East at 20 km per hour at a height 0.8 km above the ground.

p is a point on the ground directly underneath the path of the balloon and at 10 a.m. the angle of elevation of b as measured from p is $23^\circ 35'$.

(i) How far is the balloon from p at 10 a.m. ?

(ii) Find the time, to the nearest minute, when the balloon is at k where $|\angle bpk| = 90^\circ$.



(30 marks)