You will not
This time is to be spent in
The time given at the head of this paper is the time allowed
answer.

Attempt all questions from Section A and any four questions from Section B
All working including rough work, must be clearly shown, and must be done on the same sheet as the rest of the answer.
Omission of essential working will result in loss of marks.
The intended marks for questions or parts of questions are given in brackets[]
Mathematical tables are provided

SECTION-A

[Attempt all questions from this section] [15]

Question -1

Choose the correct answers to the questions from the given options:
(Do not copy the question, write the correct answers only)

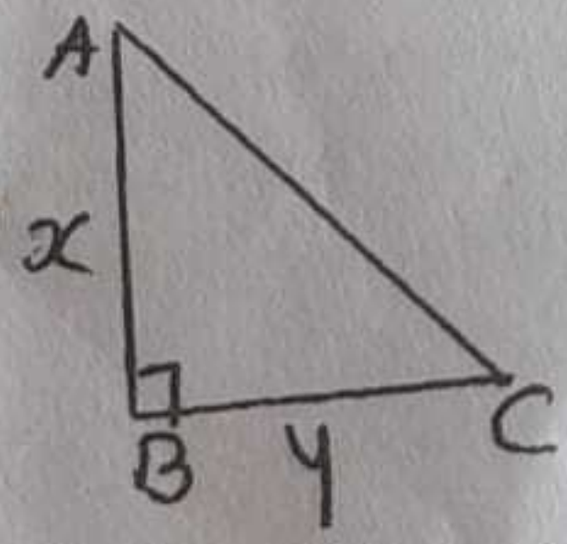
1. A retailer buys a article at its listed price from a whole saler and sells it to a consumer in the same state after marking up the price by 20%. The list price of the article is Rs.2500, and the rate of GST is 12%. What is the tax liability of the retailer to the central government?
(a) Rs. 0 (b) Rs.15 (c) Rs.30 (d) Rs.60

2. Rs. P is deposited for n number of months in a recurring deposit account which pays interest at the rate of r% per annum. The nature and time of interest calculated is
(a) Compound interest for n number of months
(b) Simple interest for n number of months
(c) Compound interest for one month
(d) Simple interest for one month

3. Mr. Das invests in Rs.100, 12% shares of company A available at Rs.60 each. Singh invests in Rs.50, 16% shares of company B available at Rs.40 each. Use this information to state which following statements is true.
(a) The rate of return for Mr. Das is 12%
(b) The rate of return for Mr. Singh is 10%
(c) Both Mr. Das and Mr. Singh have the same rate of return of 10%
(d) Both Mr. Das and Mr. Singh have the same rate of return of 20%

4. The ratio of diameter to height of a Borosil cylindrical glass is 3:5. If the actual diameter of the glass is 6cm, then the curved surface area of the glass is:
(a) 120π (b) 60π (c) 30π (d) 18π

In the adjoining diagram, AB=xcm, BC= ycm and x-y = 7cm. Area of $\Delta ABC = 30cm^2$
The length of AC is
(a) 10cm (b) 12cm
(c) 13cm (d) 15cm

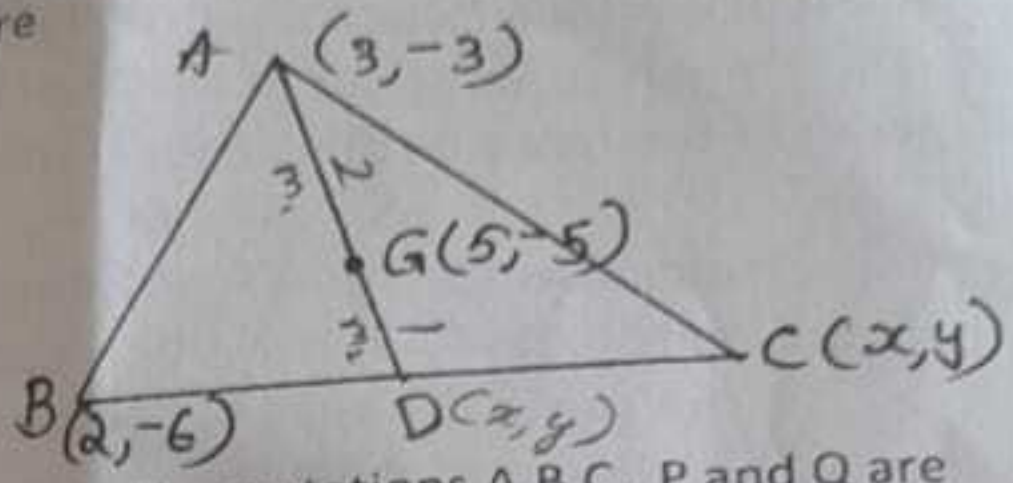


6. The product of $A=\begin{pmatrix}1 & -2\\ -3 & 4\end{pmatrix}$ and matrix M, AM=B where $B=\begin{pmatrix}2\\ 24\end{pmatrix}$, then the order of matrix M is

(a) 2 x 2 (b) 2 x1 (c) 1 x 2 (d) 4 x1

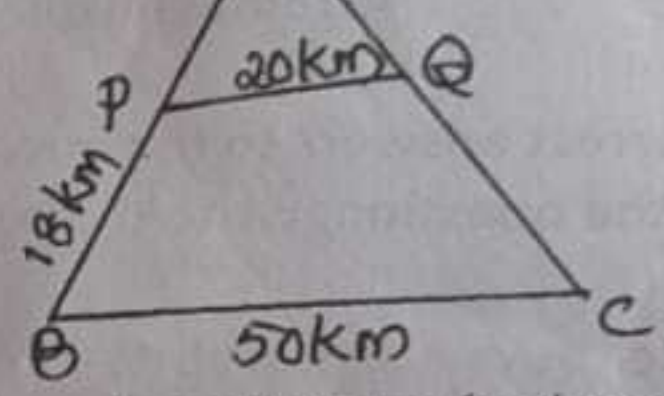
7. In the adjoining diagram, G is the centroid of $\triangle ABC$. A(3,-3), B (2,-6), C(x,y) and G (5,-5). The coordinates of point D are

(a) (2,-6) (b) (3,-6)
(c) (6,-6) (d) (10,-6)



8. In the given diagram (not drawn to scale) railway stations A,B,C , P and Q are connected by straight tracks. Track PQ is parallel to BC. The time taken by a train travelling at 90km/hr to reach B from A by the shortest route is :

(a) 8 minutes (b) 12 minutes
(c) 16.8 minutes (d) 20 minutes



9. Which of the following lines cut the positive x-axis and positive y axis at equal distance from the origin

(a) 3x+3y=6 (b) 5x +10y =10 (c) −x +y =1 (d) 10x+5y =5

10. A cylindrical metallic wire is stretched to double its length. Which of the following will not change for the wire after stretching?

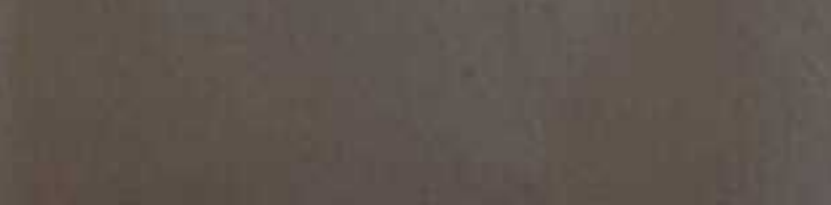
(a) Its curved surface area (c) Its volume
(b) Its total surface area (d) Its radius

11. $Cosec^2\theta + sec^2\theta$ is equal to

(a) $\tan^2\theta + \cot^2\theta$ (c) $(\cot\theta + \tan\theta)^2$
(b) $\cot\theta + \tan\theta$ (d) 1

12. Two identical solid hemispheres are kept in contact to form a sphere. The ratio of the total surface areas of the two hemispheres to the surface area of the sphere formed is

(a) 1:1 (b) 3:2
(c) 2:3 (d) 2:1



13. Assertion(A) : For a collection of 11 arrayed data, the median is the middle number

Reason (R) : For the data 5,9,7,13,10,11,10, the median is 13

(a) Both A and R are correct, and R is the correct explanation for A
(b) Both A and R are correct, and R is not the correct explanation for A
(c) A is true, but R is false (d) Both A and R are true

14. The point of concurrence of the angle bisectors of a triangle is called the ____of the triangle.

(a) Centroid (c) circumcentre

(b) incentre (d) orthocenter

15. 33-3p, 8 +4p and 28+2p are consecutive terms of an Arithmetic Progression (AP) in the given order. The value of P is

(a) 10 (b) 5 (c) 9 (d) -5

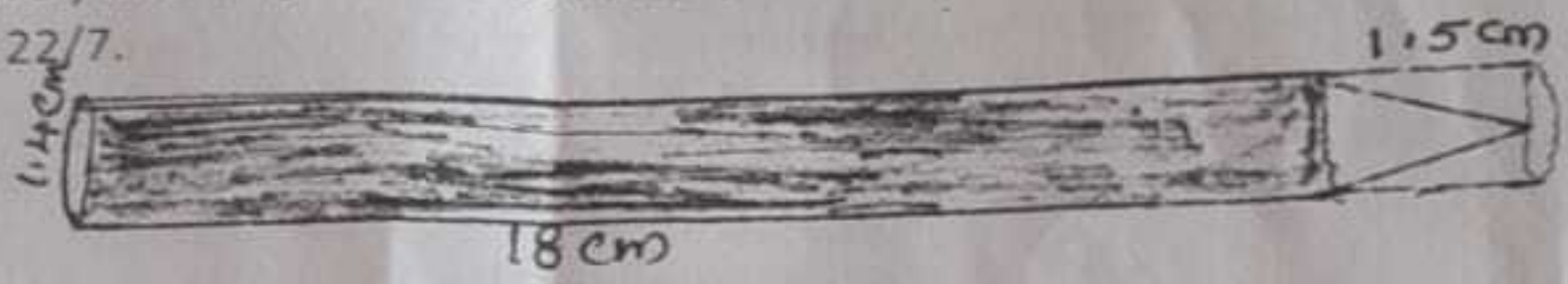
Question -2

1. Given matrix $A = \begin{pmatrix} x & 1 \\ y & 2 \end{pmatrix}$ and $B = \begin{pmatrix} x \\ x-2 \end{pmatrix}$ such that AB is a null matrix. Find [4]

(a) order of the null matrix

(b) possible values of x and y

2. A specially designed thick wooden cylindrical pencil has a sharpened conical tip, as shown in the given diagram. The length and diameter of the pencil is 18cm and 1.4cm respectively and length of the conical tip is 1.5cm. It has coating of black colour. Use $\pi = 22/7$.



Find:

(a) the volume of conical tip of the pencil

(b) the cost of coating the curved surface of cylindrical part (excluding the conical part) at the rate of Rs.0.30 per cm^2. Give your answer correct to the nearest whole number. [4]

3. Use graph sheet for this question. Take 2cm= 1unit along the axis [4]

(a) Plot parallelogram OABC where O (0,0) A (1,3) B (4,3), C(3,0)

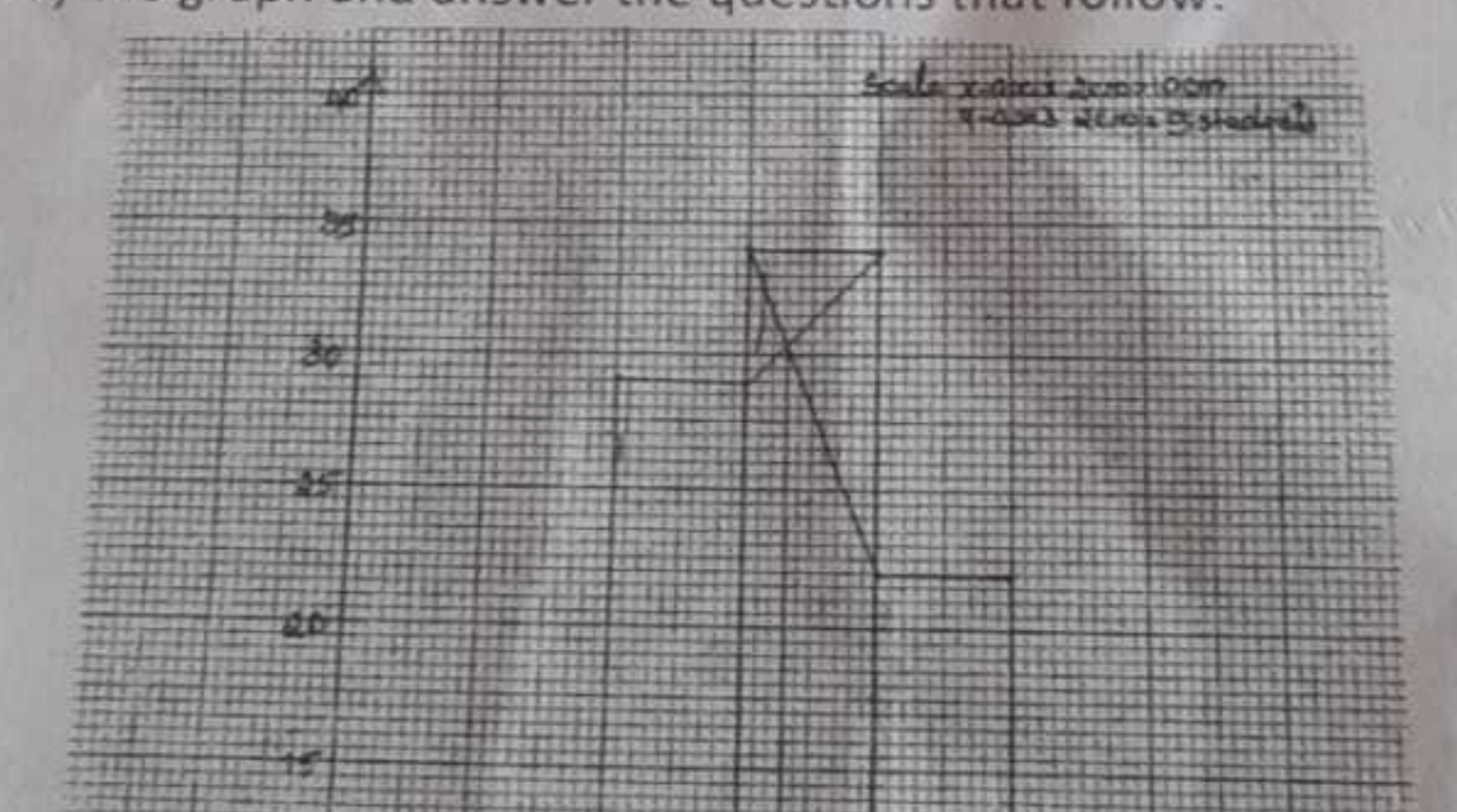
(b) Reflect the parallelogram OABC through the origin and name the figure as OPQR

(c) Reflect OABC on the x-axis and name it as OA`B`C.

(d) Name two points which are invariant where OABC is reflected on the x-axis.

Question -3

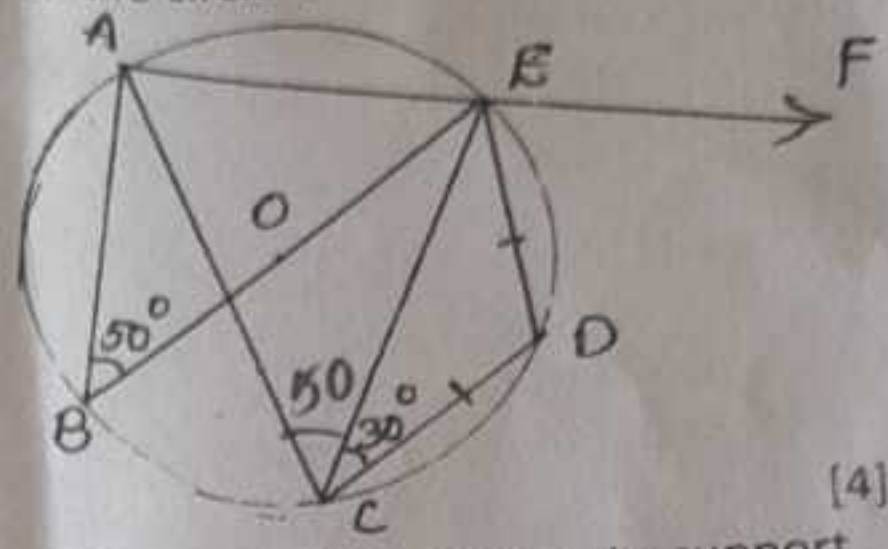
1. Study the graph and answer the questions that follow:



(a) Make frequency table for the information provided in the graph.
(b) The number of students whose height is less than 150cm
(c) The total number of students.
(d) The modal height [4]

2. In the given diagram, BE is the diameter of the circle with centre O. If CD=DE, $\angle ABE=50^0$, $\angle ECD=30^0$ find

(a) $\angle ACE$ (b) $\angle AEB$
(c) $\angle DEF$ (d) $\angle BEC$



[4]

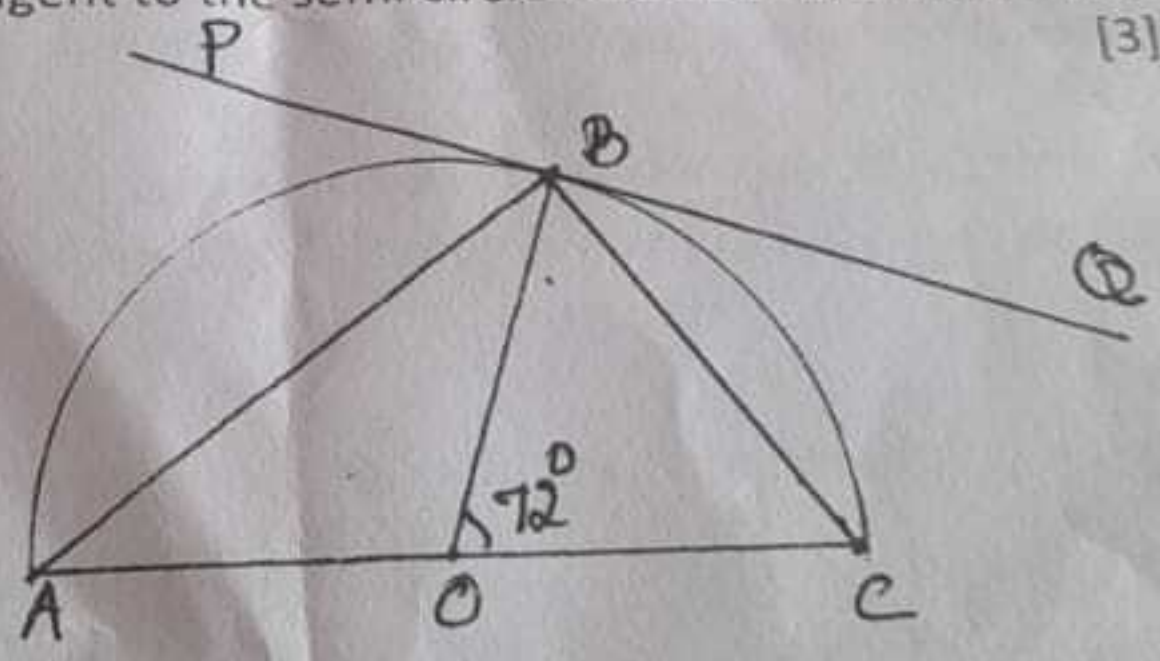
3. The sequence 2,9,16.... is given
(a) Identify if the given sequence is an AP or GP. Give reasons to support your answer
(b) Find the 20^{th} term of the sequence.
(c) Find the difference between the sum of its first 22 and 25 terms.
(d) Is the term 102 belong to this sequence?
(e) It 'K' is added to each of the above terms, will the new sequence be in AP or GP. [5]

Section –B [40 marks)
[Attempt any *four* questions from this section)

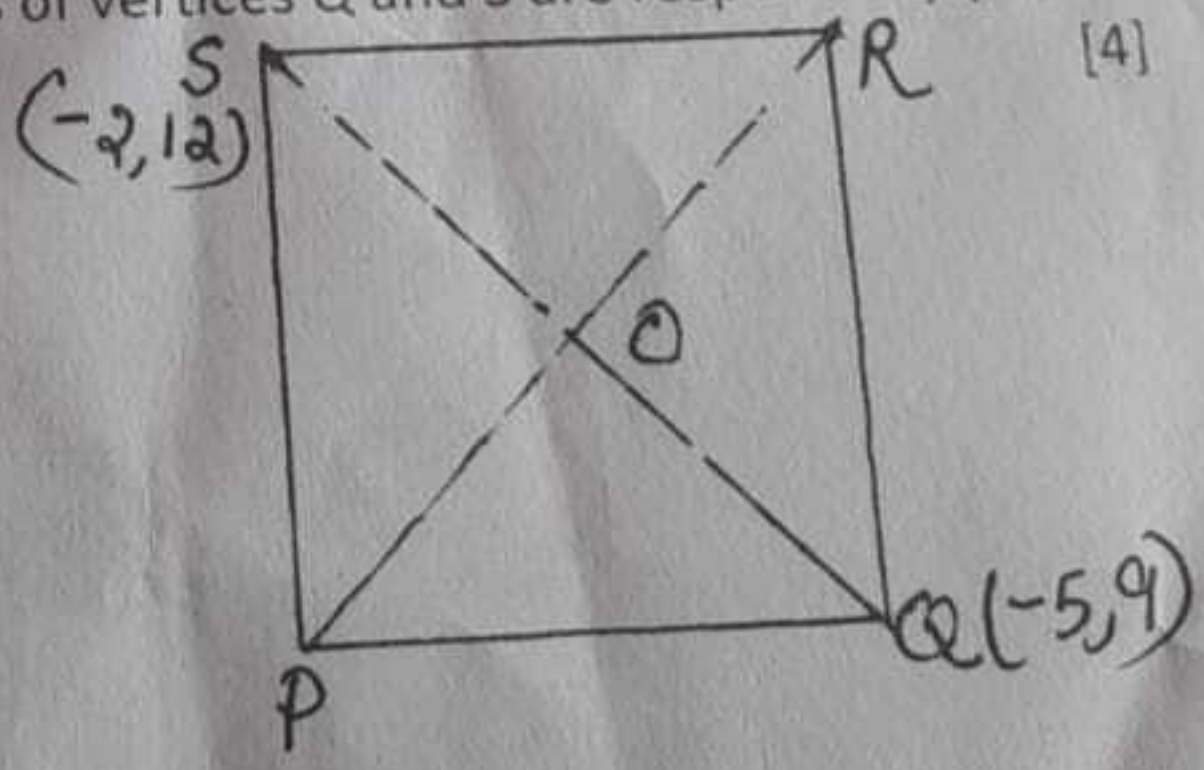
Question -4

1. Solve the following inequation.
$-(2x+11) < x-2 \leq 5-3x$, $x \varepsilon R$
Write down the solution set and represent the solution set on a real number line. [3]

2. In the given diagram, PQ is tangent to the semi circle ABC at B. O is the centre of the circle. If $BOC=72^0$, Find; [3]
a. $\angle BAC$
b. $\angle CBQ$
c. $\angle ABP$



3. PQRS is a square. The co-ordinates of vertices Q and S are respectively (-5,9) and (-2,12). Find the [4]
a. Co-ordinates of O
b. Slope of diagonal QS
c. Equation of diagonal PR



Question -5

1. A man buys 250, ten –rupee shares each at Rs. 12.50, the rate of dividend is 7%, find the [3]
a. Dividend he receives annually.
b. Percentage return on his investment

2. Given below are the weekly wages of 200 workers in a small factory

Weekly wages in Rs	80-100	100-120	120-140	140-160	160-180
No.of workers	20	30	20	40	90

Calculate the mean weekly wages of the workers by short cut method. [3]

3. If $\frac{x+1}{x-1} = \frac{\sqrt{3y+2}+\sqrt{3y-2}}{\sqrt{3y+2}-\sqrt{3y-2}}$ using properties of proportion, show that [4]

$$y = \frac{2(x^2+1)}{3(x^2-1)}$$

Question -6

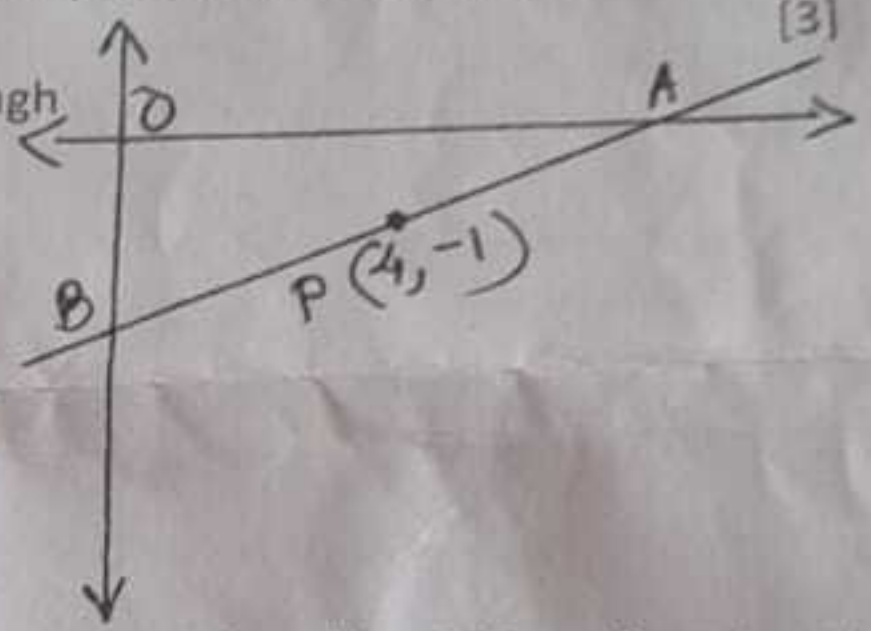
1. Sanjay goes to a shop selling electrical goods. He buys the following items.

Item	Quantity	Rate per piece	Discount(%)	GST(%)
Wall fan	01	Rs.4000	20%	18%
LED bulbs	10	Rs.300	Nil	12%

Find

a. Discounted price of the wall fan
b. Total GST paid on the two items.
c. Total bill amount, including GST [3]

2. A line AB meets X-axis at A and Y axis at B. P(4,-1) divides AB in the ratio 1:2
   a. Find the co-ordinates of A and B
   b. Find the equation of the line through P and perpendicular to AB [3]



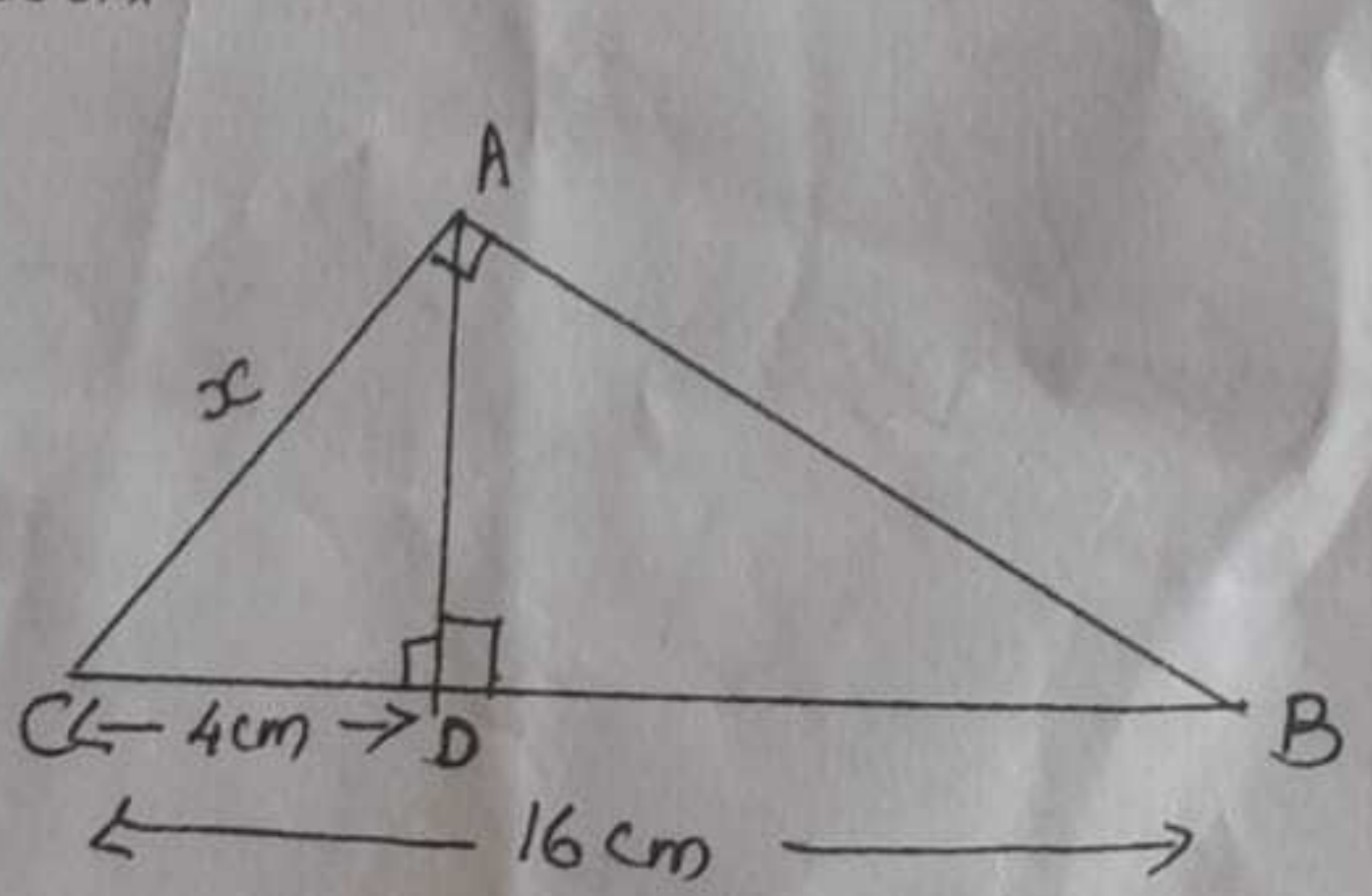
3. Using ruler and compass only, construct a circle with radius 3.8cm. Construct two chords AB and BC of lengths 6cm and 4.6cm respectively. Locate a point P, such that P is equidistant from the chords AB and BC and also equidistant from the points A and B. Measure and record length of PA. [4]

Question -7

1. Solve the following quadratic equation and give your answer correct to the two decimal places. [3]

$$3x^2+5x-6=0$$

2. Prove that $(1+\cot\theta - \operatorname{cosec}\theta)(1+\tan\theta+\sec\theta) = 2$ [3]
3. In the given figure BC=16cm; CD=4cm and CA=x cm. [4]
   a. Prove: $\Delta ACB \sim \Delta DCA$
   b. Find the value of x



Question -8

1. Following are the marks obtained by 120 students in ICSE Mathematics paper.

Marks	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No.of students	1	3	11	21	43	32	9

Represent the above data by means of an ogive use it to find [5]

i) Median
ii) percentage of students who gets more than 65 marks
iii) Lower Quartile

2. The horizontal distance between two towers is 120m. the angle of elevation of the top and angle of depression of the bottom of the first tower as observed from the top of the second tower are 30^0 and 24^0 respectively. Find the height of the two towers. Give your answer correct to 3 significant figures. [5]

Question -9

1. Cards bearing numbers 2,4,6,8,10,12,14,16,18 and 20 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card which is [3]
   a. A prime number
   b. A number divisible by 4
   c. A number that is a multiple of 6

2. A train covers a distance of 600km at xkm/hr, Had the speed been (x+20) km/hr the time taken to cover the distance would have been reduced by 5 hrs. Write down an equation in x and solve it to evaluate 'x'. [3]

3. The approximate volume of a human eye is $6.5cm^3$. The volume of a laboratory model of the human eye is $1404cm^3$.
   a. State whether the scale factor K is less than, equals to, or greater than 1 [4]
   b. Calculate the
      i. Value of K
      ii. Diameter of the human eye if the radius of the model is 7.2cm
      iii. The external surface area of the human eye if the surface area of the model is $651.6cm^2$

Question -10

1. How many terms of the series 2+6+18 ..... must be taken to make the sum equal to 728? [3]

2. Mr. Richard has a recurring deposit account in a post office for 3 years at 7.5% pa. simple interest. If he gets Rs. 8325 as interest at the time maturity, find [3]
   a. The monthly instalment
   b. The amount of maturity

3. Given, $9x^2-4$ is a factor of $9x^3-mx^2-nx+8$
   a. Find the value of m and n using the remainder and factor theorem
   b. Factorise the given polynomial completely. [4]