



# MATHS

## BOOKS - NAVBODH MATHS (HINGLISH)

### BOARD'S QUESTION PAPER

#### QUESTION

1. Find the media of : 66,98,54,92,87,63,72.



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2. Multiply and write the answer in the simplest form :  $5\sqrt{7} \times 2\sqrt{7}$ .



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3. If  $3x+5y = 9$  and  $5x+3y=7$ , then find the value of  $x+y$ .



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4. Write the ratio of second quantity of first quantity in the reduced form: 5 dozen pens, 120

pens.



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5. Write the following polynomial in coefficient form :  $2x^3 + x^2 - 3x + 4$ .



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6. for computation of income tax which is the assesment year of financial year 01-04-2016 to 31-03-2017?





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7. Find the value of the polynomial  $2x^3 + 2x$ ,  
when  $x=-1$ .



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8. Of  $A = \{11, 21, 31, 41\}$ ,  $B = \{12, 22, 31, 32\}$ ,  
then find : (1)  $A \cup B$  (2)  $A \cap B$ .



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9. Sangeeta's monthly income is ₹ 25,000 she spent 90% of her income and donated 3% for socially useful causes. How much money did she save?



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10. What is the common difference (d) of the A.P.  
2,-2,-6,-10..... ?



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11. For the quadratic equation

$x^2 + 10x - 7 = 0$ , the values of a,b,c are



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12. The tax levied by the Central government for trading within state is



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13. A die is rolled. What is the probability that the number of on the upper face is less than 2?





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14. The first term and the common difference of an A.P. are 12 and 4 respectively. If  $t_n = 96$  find  $n$ .



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15. If  $\begin{vmatrix} 4 & 5 \\ m & 3 \end{vmatrix} = 22$ , then find the value of  $m$ .



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**16.** Solve the following quadratic equations by factorisation method.

(i)  $x^2 + 8x + 15 = 0$

(ii)  $5m^2 - 22m - 15 = 0$



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**17.** Smita invested Rupees 12,000 to purchase shares of FV Rupees 10 at a premium of Rupees

2. Find the number of shares she purchased.

Completed the given activity to get the answer



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18. The following table shows the daily supply of electricity to different places in a town. To show the information by a pie diagram measure of central angles of sectors are to be decided. Complete the following activity to find the measures:

Places	Supply of electricity (Thousand units)	Measures of central angle
Roads	4	$\frac{4}{30} \times 360^\circ = 48^\circ$
Factories	12	$\frac{\quad}{\quad} \times 360^\circ = 144^\circ$
Shops	6	$\frac{6}{30} \times 360^\circ = \quad$
Houses	8	$\frac{\quad}{\quad} \times 360^\circ = \quad$
Total	30	



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19. Two coins are tossed simultaneously. Complete the following activity of writing o writing the sample space (S) and expected outcomes of the events:

Event A: to get at least one head

Event B : to get no head.

Activity : if two coins are tossed simultaneously,

$$S \{ \square, HT, TH, \square \}$$

(i) Event A : at least getting one head.

$$\therefore A = \{HH, \square, TH\},$$

(ii) Event B : to get no head.

$$\therefore B = \{ \square \}.$$



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20. Find the 19th term of the A.P. 7,13,19,25,....



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21. Obtain a quadratic equation whose roots are  
-3 and -7.



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**22.** Two numbers differ by 3. The sum of the greater number and twice the smaller number is 15. Find the smaller number.



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**23.** Amit saves certain amount every month in a specific way. In the first month he saves Rupees 200, in the second month Rupees 250. In the third month Rupees 300 and so on . How much will be his total saving in 17 months ?



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**24.** Two-digit numbers are formed from the digits 0,1,2,3 without repetition. Complete the following activity to find the probability that the number so formed is a prime number.



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**25.** Smt Malhotra purchased solar panles for the taxable value of ₹ 85,000 She sold them for ₹ 90,000 the rate of GST is 5% Find the ITC of Smt

malhotra. What is the amount of GST payable by her?



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**26.** Solve the following simultaneous equations graphically:

$$x+y=0, 2x-y=9.$$



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27. The following frequency distribution table shows marks obtained by 180 students in Mathematics examination :

Marks	Number of Students
0 – 10	25
10 – 20	$x$
20 – 30	30
30 – 40	$2x$
40 – 50	65

Find the value of  $x$ .

Also draw a histogram representing the above informations.



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**28.** Two taps running together can fill a tank in  $3\left(\frac{1}{13}\right)$  hours. If one tap takes 3 hours more than the other to fill the tank, then how much time will each tap take to fill the tank ?



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**29.** The coordinates of the point of intersection of lines  $ax + by = 9$  and  $bx + ay = 5$  are  $(3, -1)$ . Find the values of  $a$  and  $b$ .



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30. The following frequency distribution table shows the distances travelled by some rickshaws in a day. Observe the table and answer the following question:

Class (Daily distance travelled in km)	Continuous classes	Frequency (Number of rickshaws)	Cumulative Frequency less than type
60 – 64	59.5 – 64.5	10	10
65 – 69	64.5 – 69.5	34	$10 + 34 = 44$
70 – 74	69.5 – 74.5	58	$44 + 58 = 102$
75 – 79	74.5 – 79.5	82	$102 + 82 = 184$
80 – 84	79.5 – 84.5	10	$184 + 10 = 194$
85 – 89	84.5 – 89.5	6	$194 + 6 = 200$

- (a) which is the modal class? Why?
- (b) which is the median class and why?
- (c) write the cumulative frequency (c.f.) of the class preceding the median class.
- (d) what is the class interval (h) to calculate median?



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31. If  $\triangle ABC \sim \triangle PQR$  and  $\angle C = 60^\circ$ , then  $\angle P$  ?



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32. In right-angled  $\triangle ABC$ , if  $\angle B = 90^\circ$ ,  $AB = 6$ ,  $BC = 8$ , then find  $AC$ .



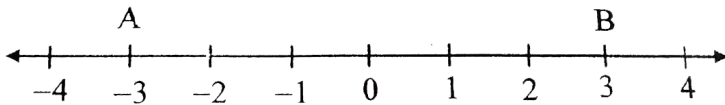
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33. Write the length of largest chord of a circle with radius 3.2 cm.



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34. From the given number line, find  $d(A, B)$ :



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35. Find the value of  $\sin 30^\circ + \cos 60^\circ$



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**36.** Find the area of a circle of radius 7 cm.



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**37.** Draw seg AB of length 5.7 cm and bisect it.



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**38.** In right-angled triangle PQR, if  $\angle P = 60^\circ$ ,  $\angle R = 30^\circ$  and  $PR = 12$ , then find the values of PQ and QR.



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**39.** In a right circular cone, if perpendicular height is 12 cm and radius is 5 cm, then find its slant height.



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40.  $\triangle ABC$  and  $\triangle DEF$  are equilateral triangles. If  $A(\triangle ABC) : A(\triangle DEF) = 1 : 2$  and  $AB=4$ , then what is the length of  $DE$  ?

A.  $2\sqrt{2}$

B. 4

C. 8

D.  $4\sqrt{2}$

**Answer:**  $4\sqrt{2}$



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41. Out of the following which is a Pythagorean triplet?

A. (5,12,14)

B. (3,4,2)

C. (8,15,17)

D. (5,5,2)

**Answer: (8,15,17)**



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42.  $\angle ACB$  is inscribed in arc  $ACB$  of a circle with centre  $O$ . If  $\angle ACB = 65^\circ$ , find  $m(\text{arc } ACB)$ .

A.  $130^\circ$

B.  $295^\circ$

C.  $230^\circ$

D.  $65^\circ$

**Answer:**  $230^\circ$



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43.  $1 + \tan^2 \theta = ?$

A.  $\sin^2 \theta$

B.  $\sec^2 \theta$

C.  $\cos^2 \theta$

D.  $\cot^2 \theta$

**Answer:**  $\sec^2 \theta$



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**44.** Construct tangent to a circle A and radius 3.4 cm at any point P on it.



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**45.** Find slope of a line passing through the points A(3, 1) and B(5, 3).



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**46.** Find the surface area of a sphere of radius 3.5 cm.



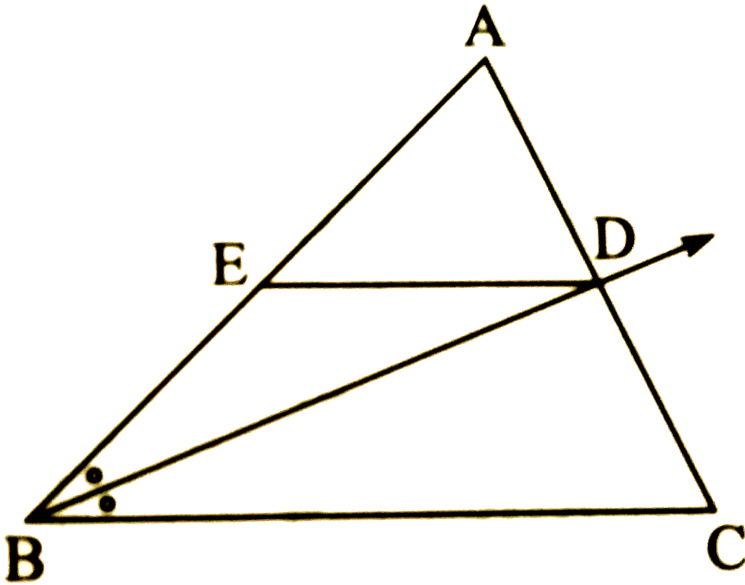
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47. In  $\triangle ABC$ , ray  $BD$  bisects  $\angle ABC$ .

$A - D - C$ , side  $DE \parallel$  side  $BC$ ,  $A - E - B$ .

Prove that,  $\frac{AB}{BC} = \frac{AE}{EB}$ .

Complete the activity by filling the boxes.



In  $\triangle ABC$ , ray  $BD$  is the bisector of  $\angle ABC$

$$\therefore \frac{AB}{BC} = \square \dots\dots(I) \quad (\text{By angle bisector theorem})$$

In  $\triangle ABC$ , seg  $DE \parallel$  side  $BC$

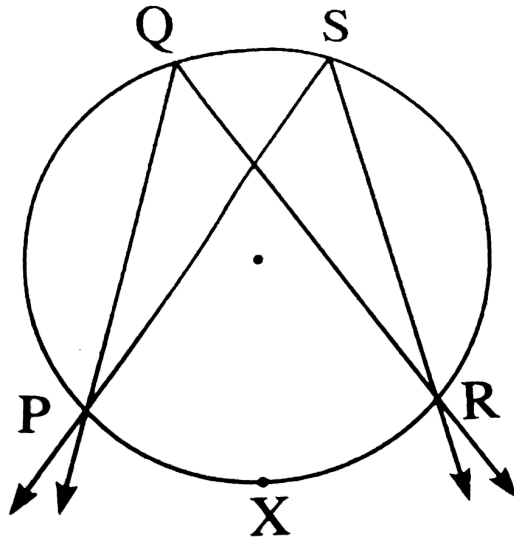
$$\therefore \frac{AE}{EB} = \frac{AD}{DC} \dots\dots(II) \quad \square$$

$$\therefore \frac{AB}{\square} = \frac{\square}{EB} \dots\dots[\text{From (I) and (II)}]$$



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(ii)



48.

Prove that, angles inscribed in the same arc are congruent .

Given :  $\angle PQR$  and  $\angle PSR$  are inscribed in the same arc  $PXR$ .  $PXR$  is intercepted by the angles.

To prove :  $\angle PQR \cong \angle PSR$

Proof :

$$m\angle PQR = \frac{1}{2}m(\text{arc}PXR) \quad (I)$$



m

$$\angle \dots\dots\dots = \frac{1}{2}m(\text{arc } PXR) \quad (II)$$

$$\therefore m\angle \dots\dots\dots = m\angle PSR \quad (\text{From I and$$

II)

$$\therefore \angle PQR \cong \angle PSR \quad (\text{Angles$$

equal in measure are congruent )



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**49.** How many solid cylinders of radius 6 cm and height 12 cm can be made by melting a solid sphere of radius 18 cm ?

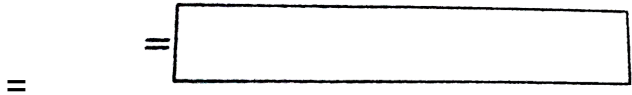
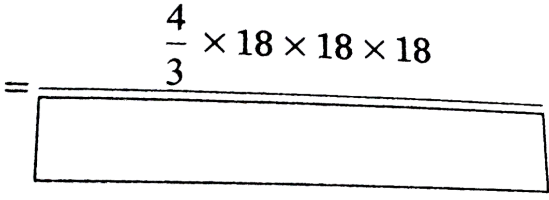
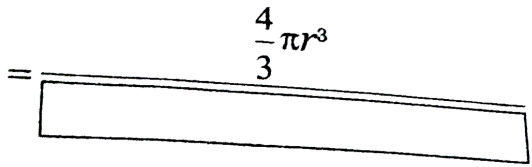
Activity : Radius of the sphere ,  $r=18$  cm

For cylinder , radius  $R =6$  cm, height  $H =12$  cm

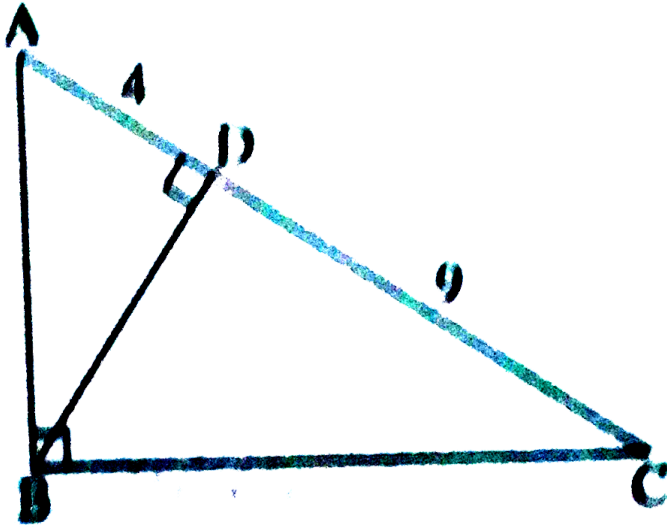
$\therefore$  Number of cylinders can be made =  
Volume of the sphere

.....

$$= \frac{\frac{4}{3} \pi r^3}{\dots\dots\dots}$$
$$= \frac{\frac{4}{3} \times 18 \times 18 \times 18}{\dots\dots\dots}$$



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50.

In right -angled  $\triangle ABC$ ,  $BD \perp AC$ .

If  $AD = 4$   $DC = 9$  then find  $BD$ .



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51. Verify whether the following points are collinear or not:



A (1, -3), B (2, -5), C (-4, 7).



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52. If  $\sec \theta = \frac{25}{7}$ , then find the value of  $\tan \theta$



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53. In  $\Delta PQR$ , seg PM is a median,  $PM=9$  and  $PQ^2 + PR^2 = 290$ . Find the length of QR.



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**54.** In the figure, O is the centre of circle

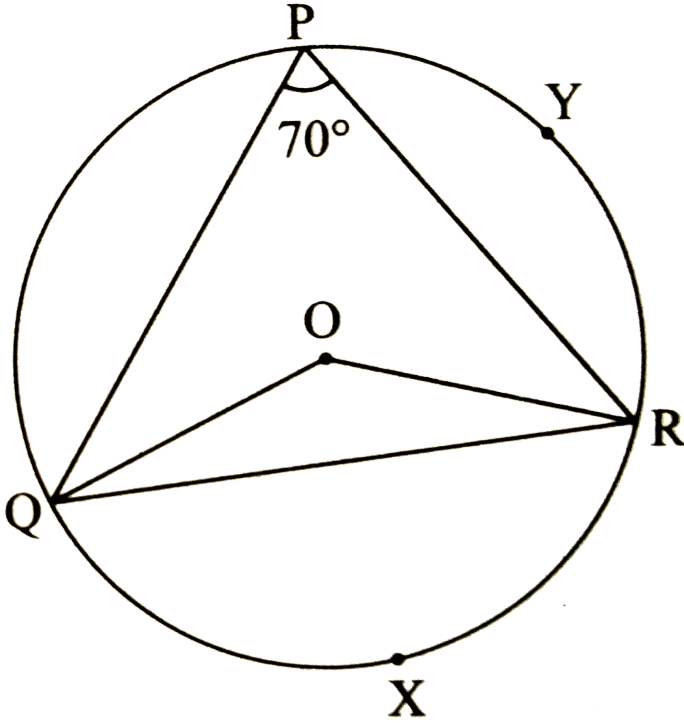
$\angle QPR = 70^\circ$  and  $m(\text{arc PYR}) = 160^\circ$ , then

find the value of each of the following :

(a)  $m(\text{arc QXR})$

(b)  $\angle QOR$

(c)  $\angle PQR$



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55. Draw a circle with radius 4.2 cm . Construct tangents to the circle from a point at a distance

of 7 cm from the centre .



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**56.** When an observer at a distance of 12 m from a tree looks at the top of the tree, the angle of elevation is  $60^\circ$ . What is the height of the tree?

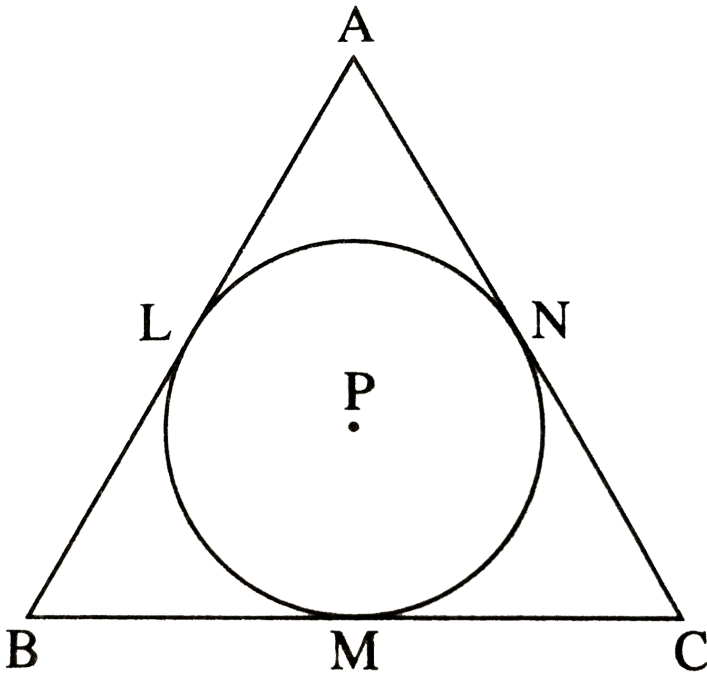


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**57.** A circle with centre P is inscribed in the  $\triangle$  ABC. Side AB, side BC and side AC touch the

circle at points L, M and N respectively. Radius of the circle is  $r$ . Prove that:

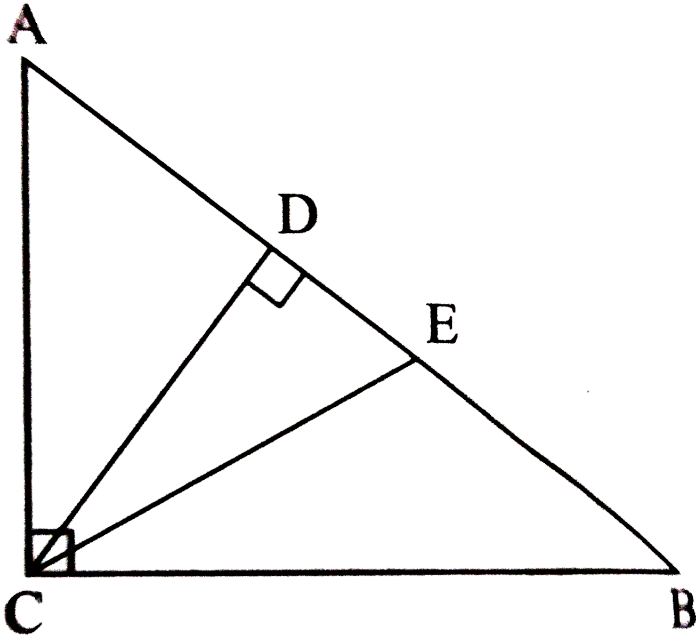
$$A(\triangle ABC) = \frac{1}{2}(AB + BC + AC) \times r.$$



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58. In  $\triangle ABC$ ,  $\angle ACB = 90^\circ$ , seg  $CD \perp$  side  $AB$  and seg  $CE$  is angle bisector of  $\angle ACB$

Prove:  $\frac{AD}{BD} = \frac{AE^2}{BE^2}$



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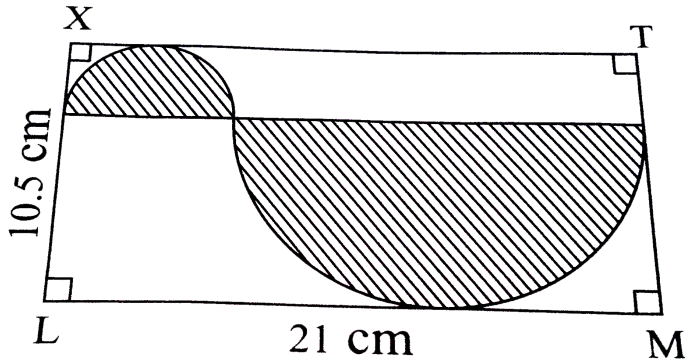
**59.** Show that the points  $(2,0)$ ,  $(-2,0)$  and  $(0,2)$  are the vertices of a triangle. Also state with reason the type of the triangle .



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**60.** In the figure,  $\square XLMT$  is a rectangle.  $\angle M = 21\text{cm}$ ,  $XL = 10.5\text{ cm}$ . Diameter of the smaller semicircle is half the diameter of larger

semicircle. Find the area of non-shaded region.



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