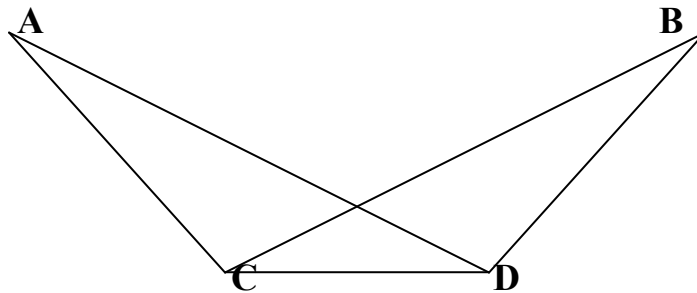
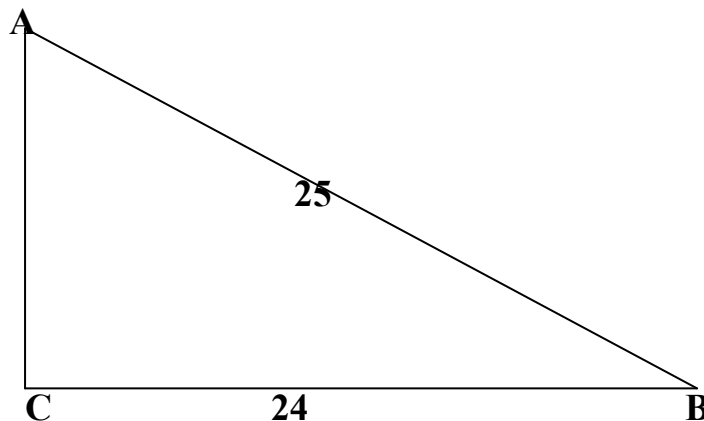


**MATHS**  
**IX**  
**SECTION A 3 MARKS EACH**

1. If the cost price of 15 articles is same as the selling price of 12 articles, find the gain or the loss percent?
2. prove that  $(a + b)^3 + (b + c)^3 + (c + a)^3 - 3(a + b)(b + c)(c + a) = 2(a^3 + b^3 + c^3 - 3abc)$
3. A square is inscribed in the circle. Find the ratio of the area of the circle and the square?
4. The base of the right pyramid is equilateral triangle with base of 4 cm. the height is half that of the slant height. Find the volume?
5. In the figure below,  $\angle BCD = \angle ADC$ ,  $\angle ACB = \angle BDA$ , prove that  $AD = BC$ .



6. If in triangle ABC  $\angle C$  is the right angle then find  $\sin B$ ,  $\cos B$  and  $\tan B$ ?



7. In what time 2400/- will amount to 2646/- at 10% p.a?
8. Two numbers are in ratio 1:2. When 4 is added to each the ratio becomes 2:3. Find the numbers?

9. If  $a$  is multiplied to the each deviation  $x_1, x_2, x_3, \dots, x_n$ , then show that the new mean = old mean  $\times a$ .
10. The mean of 5 numbers is 27. If one number is excluded the mean becomes 25. Find that excluded number?

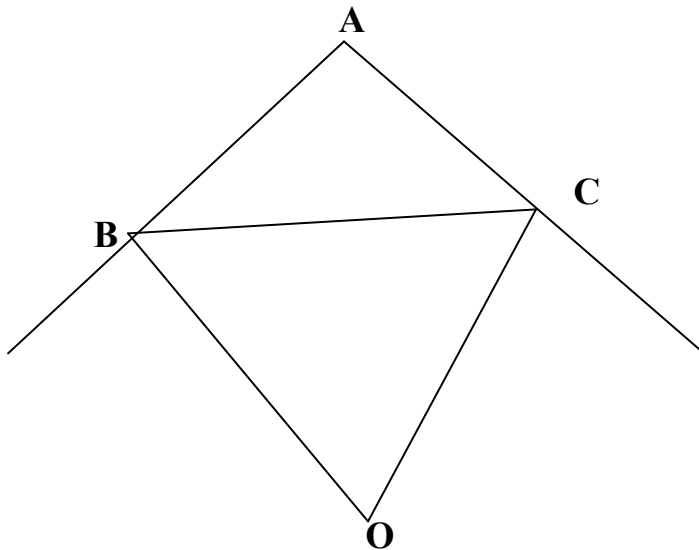
**SECTION B 4 MARKS EACH**

11. Find  $a$  and  $b$

$$\frac{\sqrt{2} + \sqrt{3}}{3\sqrt{2} - 2\sqrt{3}} = a - b\sqrt{6}$$

12. Pratap purchased a motorcycle for 37388/- inclusive of the sales tax. find the list price if the tax is 4%?
13. In the figure below,  $BO$  and  $OC$  are the angle bisectors. Prove that

$$\angle BOC = 90^\circ - \frac{1}{2} \angle A$$



14. If  $BD$  and  $CE$  are the altitudes of the triangle  $ABC$  such that  $AB = AC$ , then prove that  $BD = CE$ .
15. The marks of 30 students is given below, form the frequency table, cumulative frequency table with the intervals as 0 – 10.

42, 21, 50, 37, 42, 37, 38, 42, 49, 52, 38, 53, 57, 47, 29, 59, 61, 33, 17, 17, 39, 44, 42, 39, 14, 7, 27, 19, 54, 51.

16. Factorize  $y^2/2 - 3y + 4$ .

<u>17. MONTH</u>	<u>DEPOSIT</u>	<u>WITHDRAWL</u>	<u>BALANCE</u>
Jan 1			1500
Jan 5	1000		2500
Jan 20		500	2000
Feb 15	1200		3200
Feb 27		700	2500
May 8		1000	1500
May 15	700		2200
June 3	1500		3700
June 14	700		4400
June 28		1200	3200
Aug 12	2000		5200
Aug 30		1300	3900
Nov 1	600		4500
Nov 20	1000		5500
Dec 8		1200	4300
Dec 20	2000		6300

If the account is closed on 29 December find the amount he gets after the interest of 6%.

18. Find  $5 \sin^2 30 + \cos^2 45 + 4 \tan^2 60$

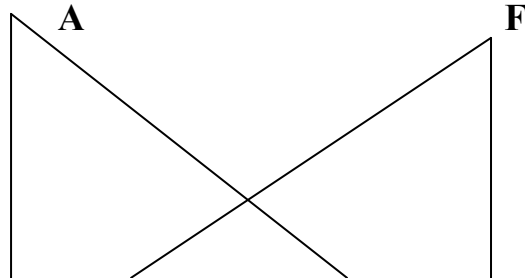
$$\frac{2 \sin 30 \cos 60 + \tan 45}{\dots}$$

19. Derive the formula for the total surface area and volume for the regular tetrahedron.

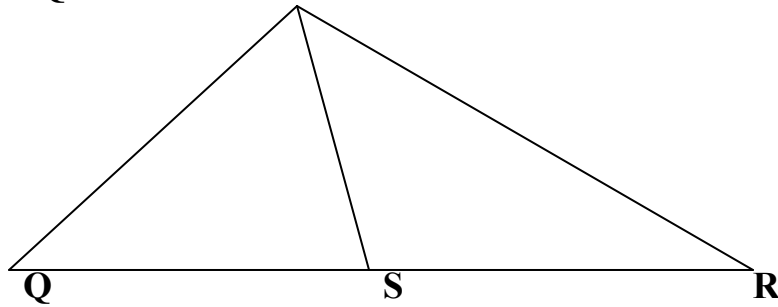
20. The base of the right pyramid is equilateral triangle of side 4 cm. the height of the pyramid is half the slant height. Find the volume and the length of the slant edge?

**SECTION C 6 MARKS EACH**

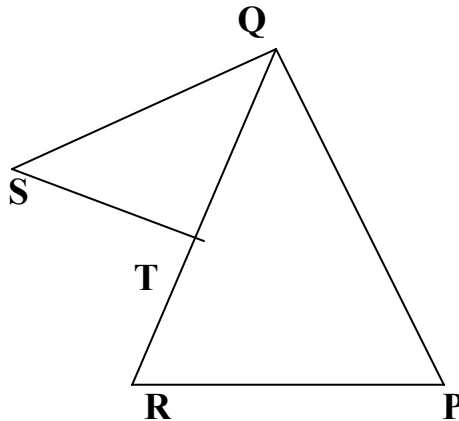
21. In the figure below, AB and FE are the altitudes and BC = DE. Prove that AD = CF.



$\overline{B \quad C \quad D \quad E}$   
**22.**In the figure if  $PR > PQ$  and  $PS$  is the bisector then prove that  $\angle PSR > \angle PSQ$ .



**23.**In the figure below, if  $RT = ST$  prove that  $PQ + PR > QS$



**24.**Prove that the area of the trapezium is  $\frac{1}{2}$  x sum of the parallel sides' x distance between them.

**25.**If the bisector of an angle of the triangle also bisects the opposite side then prove that the triangle is isosceles.