

Self Assessment Paper

Section 'A'

Q 1- Q 10 are multiple choice questions. Select the most appropriate answer from the given options.

1. HCF of 96 and 404 is

- (a) 4 (b) 32 (c) 96 (d) 404

2. Product of two numbers is equal to

- (a) $\frac{LCM}{HCF}$ (b) $\frac{HCF}{LCM}$ (c) $LCM \times HCF$ (d) $(LCM \times HCF)^2$

3. If a pair of linear equations is consistent, then the lines will be :

- (a) parallel (b) always coincident
(c) intersecting or coincident (d) never intersecting

4. Which of the following equations has not 2 as a root?

- (a) $x^2 - 4x + 5 = 0$ (b) $x^2 + 3x - 12 = 0$ (c) $2x^2 - 7x + 6 = 0$ (d) $3x^2 - 6x - 2 = 0$

5. If the point C (*k*, 4) divides the join of points A(2, 6) and B (5, 1) in the ratio 2 : 3, then the value of *k* is :

- (a) 16 (b) $\frac{28}{5}$ (c) $\frac{16}{5}$ (d) $\frac{8}{5}$

6. If the angle between two tangents drawn from an external point P to a circle of radius '*a*' and centre O, is 60°, then length of OP is :

- (a) *a* (b) 2*a* (c) 3*a* (d) 4*a*

7. $9 \sec^2 A - 9 \tan^2 A$ is equal to

- (a) 1 (b) 9 (c) 8 (d) 0

8. The area of the circle that can be inscribed in a square of side 6 cm is :

- (a) $36\pi \text{ cm}^2$ (b) $18\pi \text{ cm}^2$ (c) $12\pi \text{ cm}^2$ (d) $9\pi \text{ cm}^2$

9. The radius of solid sphere is *r* cm. It is divided into two equal parts. Find the whole surface of two parts.

- (a) $2\pi r^2$ (b) $3\pi r^2$ (c) $6\pi r^2$ (d) πr^2

10. In the formula $\bar{x} = a + \frac{\sum x_i d_i}{\sum f_i}$ for finding the mean of grouped data *d_i*'s are the deviations from *a* of :

- (a) lower limits of the classes (b) upper limits of the classes
(c) mid-points of the classes (d) frequencies of the class marks

12. The largest number which divided 70 and 125, leaving remainder 5 and 8, respectively is
13. The pair of equations $x = a$ and $y = b$ graphically represents lines which are
14. The sum of first 8 multiplies of 3 is

(11-15) Fill in the blanks

- 11. The area of a triangle with vertices $(a, b + c)$, $(b, c + a)$ and $(c, a + b)$ is
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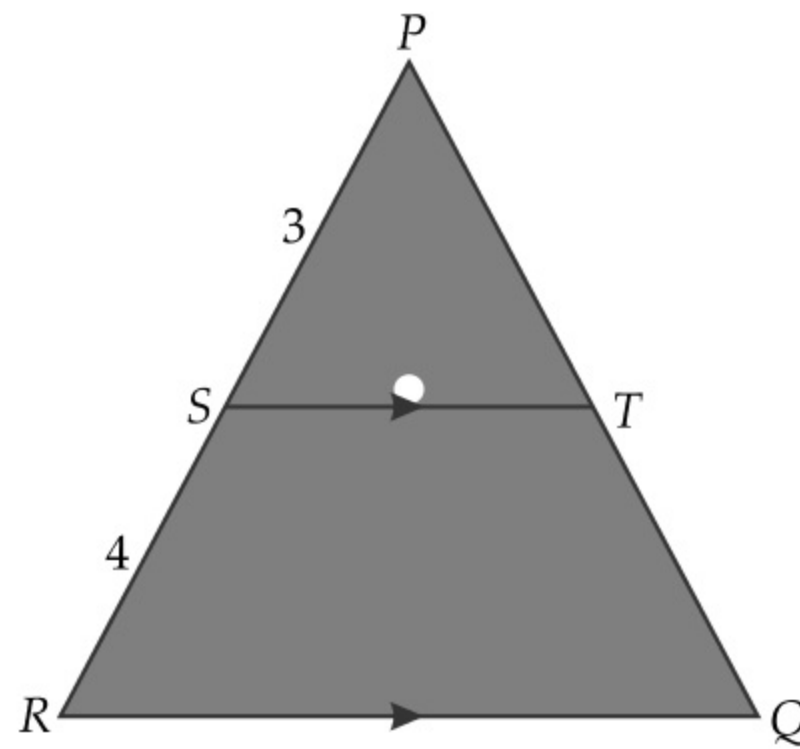
OR

The 21st term of the A.P. $-4\frac{1}{2}, -3, -1\frac{1}{2}, \dots$ is

- 15. $\sin(45^\circ + \theta) - \cos(45^\circ - \theta)$ is equal to

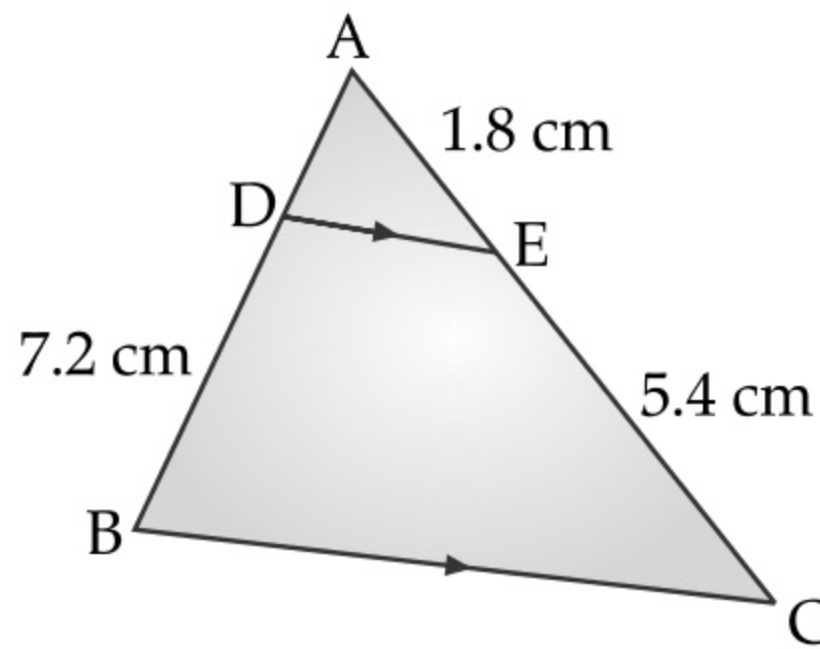
(16-20) Answer the following

- 16. In the given figure, $ST \parallel RQ$, $PS = 3$ cm and $SR = 4$ cm. Find the ratio of the area of ΔPST to the area of ΔPRQ .

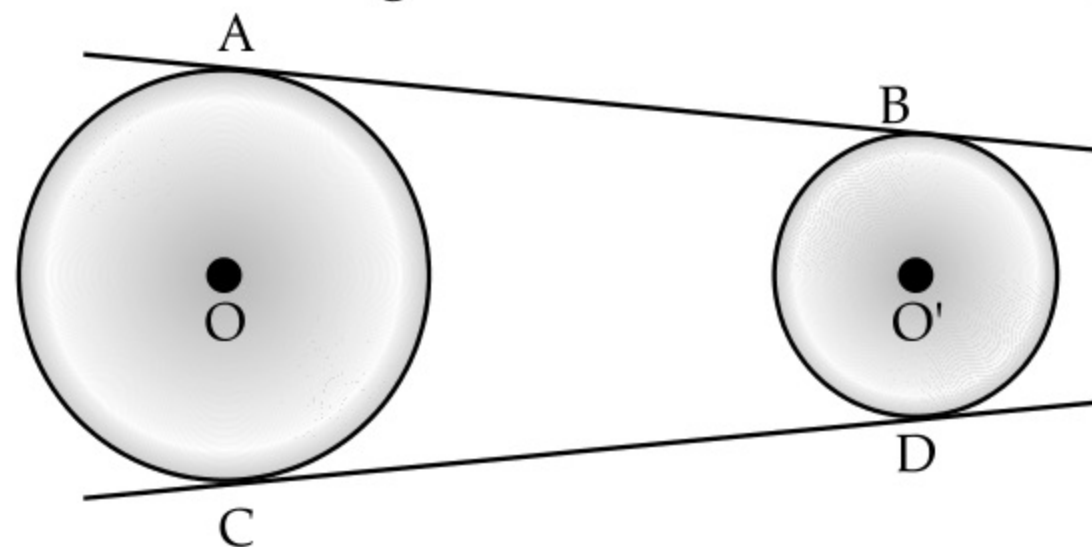


OR

In the given figure, $DE \parallel BC$. Find the length of side AD, given that $AE = 1.8$ cm, $BD = 7.2$ cm and $CE = 5.4$ cm.



- 17. In the figure, AB and CD are common tangents to two circles of unequal radii. Prove that $AB = CD$.



- 18. The diameters of two circles with centre A and B are 16 cm and 30 cm respectively. If area of another circle with centre C is equal to the sum of areas of these two circles, then find the circumference of the circle with centre C .
- 19. A solid metallic cuboid of dimensions $9 \text{ m} \times 8 \text{ m} \times 2 \text{ m}$ is melted and recast into solid cubes of edge 2 m. Find the number of cubes so formed.
- 20. The probability of selecting a rotten apple randomly from a heap of 900 apples is 0.18. What is the number of rotten apples in the heap?

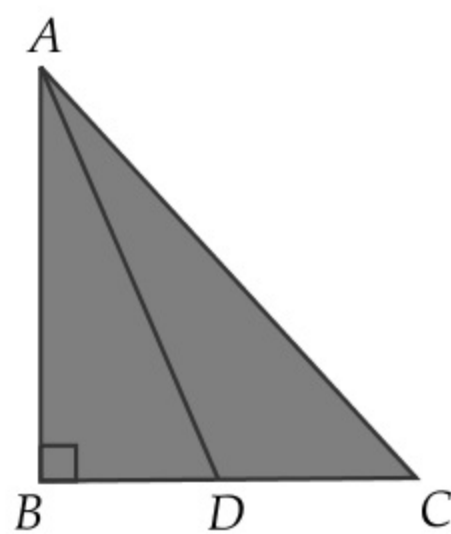
Section 'B'

21. Rohan wants to renovate his room. He calls an architect for this work to measure the room. The length, breadth and height of a room are 8m 50 cm; 6m 25 cm and 4 m 75 cm respectively. He wants to put the longest rod that can measure the dimensions of the room exactly.
22. A die is thrown once. Find the probability of getting a number which (i) is a prime number, (ii) lies between 2 and 6.

OR

A game consists of tossing a coin 3 times and noting the outcome each time. If getting the same result in all the tosses is a success, find probability of losing the game.

- [AI]** 23. In the given figure, ABC is a right angled triangle at $\angle B = 90^\circ$. D is the mid-point of BC . Show that $AC^2 = AD^2 + 3CD^2$.



24. If $\sqrt{3} \sin \theta - \cos \theta = 0$ and $0^\circ < \theta < 90^\circ$, find the value of θ .
25. During the Sunset, shadow of the tower increases. The shadow of a tower at is three times as long as its shadow when the angle of elevation of the Sun is 60° . Find the angle of elevation of the Sun at the time of the longer shadow.
26. The slant height of a frustum of a cone is 4 cm and the perimeters of its circular ends are 18 cm and 6 cm. Find the curved surface area of the frustum.

OR

The $\frac{3}{4}$ th part of a conical vessel of internal radius 5 cm and height 24 cm is filled of water. The water is emptied into a cylindrical vessel with internal radius 10 cm. Find the height of water in cylindrical vessel.

Section 'C'

27. If α and β are the zeroes of polynomial $P(x) = 3x^2 + 2x + 1$, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha}$ and $\frac{1-\beta}{1+\beta}$.

OR

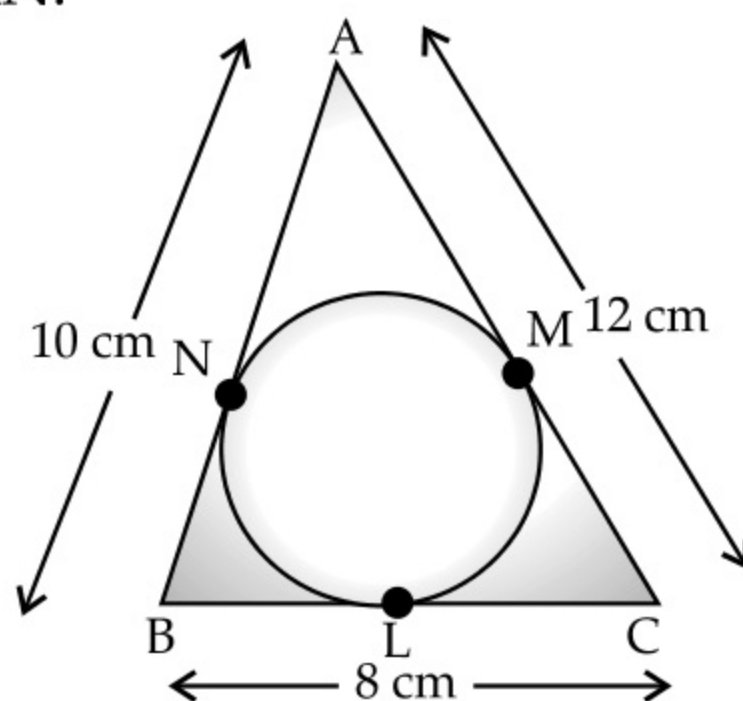
Given that $x - \sqrt{5}$ is a factor of the polynomial $x^3 - 3\sqrt{5}x^2 - 5x + 15\sqrt{5}$, find all the zeroes of the polynomial.

28. Ashima plays a game with her friend. She asked to assume any two digits number then follow this instruction as seven times a two digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, determine the number that she has assumed.
29. Check whether the equation $5x^2 - 6x - 2 = 0$ has real roots and if it has, find them by the method of completing the square. Also, verify that roots obtained satisfy the given equation.
30. Which term of the Arithmetic progression $-7, -12, -17, -22, \dots$ will be -82 ? Is -100 any term of the A.P.? Give reason for your answer.

OR

The first term of an AP is 5, the last term is 45 and the sum of all its terms is 400. Find the number of terms and the common difference of the A.P.

31. In the given figure, a circle is inscribed in a ΔABC having sides $BC = 8$ cm, $AB = 10$ cm and $AC = 12$ cm. Find the length BL , CM and AN .

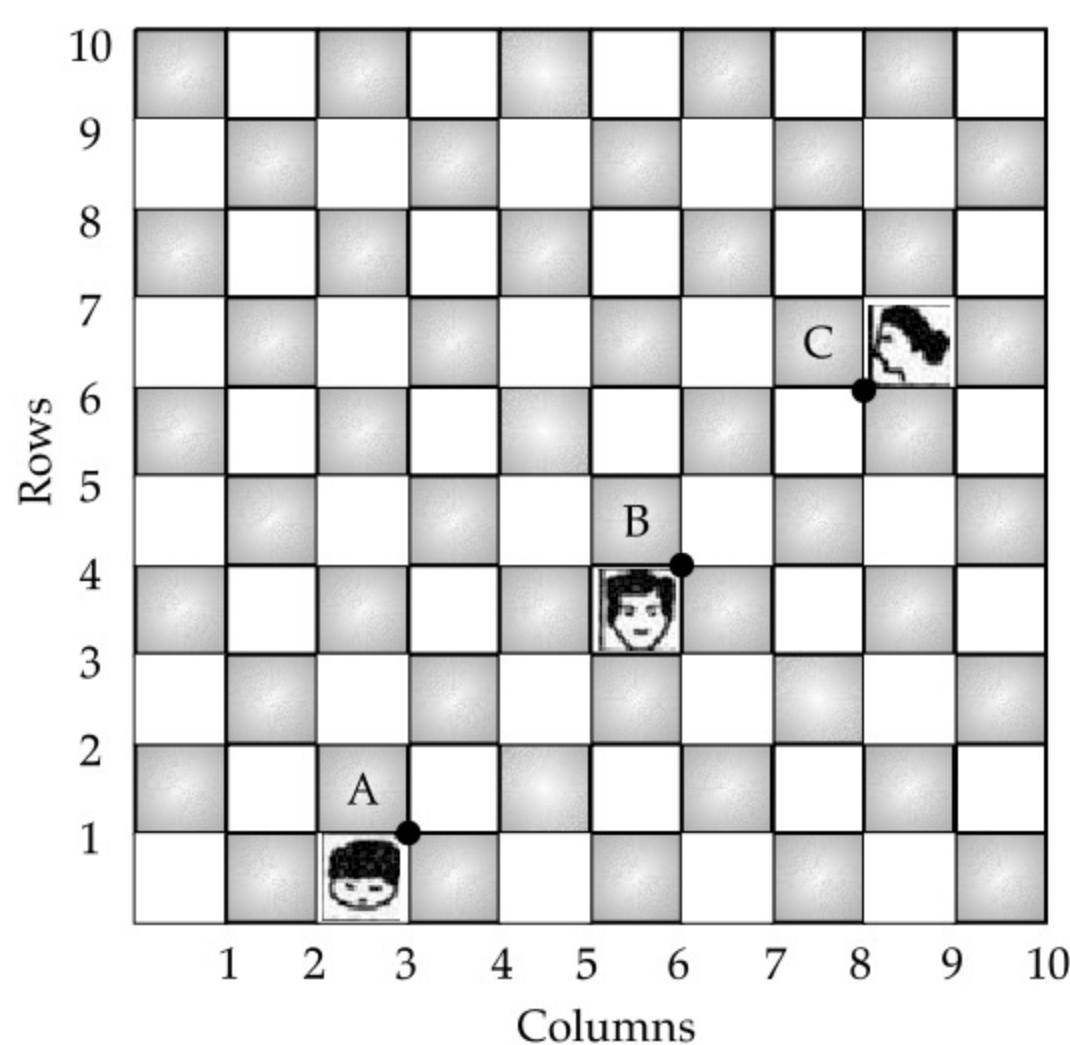


OR

Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTO = 2\angle OPQ$

32. Given figure shows the arrangement of desks in a classroom. Ashima, Bharti and Camella are seated at $A(3, 1)$, $B(6, 4)$ and $C(8, 6)$ respectively.

(i) Do you think they are seated in a line? Give reasons for your answer.



(ii) Which mathematical concept is used in the above problem?

33. Prove that $\frac{\tan^2 A}{\tan^2 A - 1} + \frac{\operatorname{cosec}^2 A}{\sec^2 A - \operatorname{cosec}^2 A} = \frac{1}{1 - 2\cos^2 A}$
34. If the mean of the following frequency distribution is 91, and sum of frequencies is 150, find the missing frequency x and y :

Classes	0 – 30	30 – 60	60 – 90	90 – 120	120 – 150	150 – 180
Frequency	12	21	x	52	y	11

Section 'D'

35. Speed of a boat in still water is 15 km/hr. It goes 30 km upstream and returns back at the same point in 4 hours 30 minutes. Find the speed of the stream.

OR

Two taps running together can fill a tank in $3\frac{1}{13}$ hours. If one tap takes 3 hours more than the other to fill the

tank, than how much time will each tap take to fill the tank ?

36. Find the ratio in which the y-axis divides the line segment joining the points $(-1, -4)$ and $(5, -6)$. Also, find the co-ordinates of the points of intersection.
37. Draw a right triangle in which sides (other than hypotenuse) are 4 cm and 3 cm. Then construct another triangle whose sides are $\frac{3}{5}$ times the (corresponding) sides of given triangle.

OR

Draw an isosceles triangle ABC in which the base is 8 cm long and its altitude AD through A is 4 cm long. Then draw another triangle whose sides are $\frac{2}{3}$ of the corresponding sides of ΔABC .

38. If $\tan \theta = \frac{1}{\sqrt{5}}$,

(i) Evaluate : $\frac{\operatorname{cosec}^2 \theta - \sec^2 \theta}{\operatorname{cosec}^2 \theta + \sec^2 \theta}$

(ii) Verify the identity : $\sin^2 \theta + \cos^2 \theta = 1$.

39. A cone of radius 10 cm is divided into two parts by a plane parallel to its base through the mid-point of its height. Compare the volume of the two parts.

OR

In a rain water harvesting system, the rain water from a roof $22 \text{ m} \times 20 \text{ m}$ drains into a cylindrical tank having diameter of base 2 m and height 3.5 m. If the tank is full, find the rainfall in cm. Write your views on water conservation.

40. The table below shows the daily expenditure on food of 25 households in a locality. Find the mean daily expenditure on food.

Daily expenditure (in ₹)	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
Number of households	4	5	12	2	2