RAVI MATHS TUITION CENTER , WHATSAPP - 8056206308

10th MATHS 2ND MID TERM IMPORTANT

10th Standard

Maths

Multiple Choice Question

60 x 1 = 60

1) For the given matrix A = $\begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is

(a) 2 x 3 (b) 3 x 2 (c) 3 x 4 (d) 4 x 3

2) If A is a 2 x 3 matrix and B is a 3 x 4 matrix, how many columns does AB have

(a) 3 (b) 4 (c) 2 (d) 5

3) If number of columns and rows are not equal in a matrix then it is said to be a

(a) diagonal matrix (b) rectangular matrix (c) square matrix

(d) identity matrix

4) Transpose of a column matrix is

(a) unit matrix (b) diagonal matrix (c) column matrix (d) row matrix

5) Find the matrix X if $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$

(a) $\begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$ (b) $\begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$ (c) $\begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$ (d) $\begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$

6) Which of the following can be calculated from the given matrices A = $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$, B = $\begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$,

(i) A^2

(ii) B^2

(iii) AB

(iv) BA

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (ii) and (iv) only (d) all of these

7) If A = $\begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, B = $\begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and C = $\begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$, Which of the following statements are correct?

(i) AB + C = $\begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$

(ii) BC = $\begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$

(iii) BA + C = $\begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$

(iv) (AB)C = $\begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$

(a) (i) and (ii) only (b) (ii) and (iii) only (c) (iii) and (iv) only (d) all of these

8) If $2A+3B=\begin{bmatrix} 2 & -1 & 4 \\ 3 & 2 & 5 \end{bmatrix}$ and $A+2B=\begin{bmatrix} 5 & 0 & 3 \\ 1 & 6 & 2 \end{bmatrix}$ then B=[hint:B=(A+2B)-(2+3B)]

(a) $\begin{bmatrix} 8 & -1 & -2 \\ -1 & 10 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 8 & -1 & 2 \\ -1 & 10 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} 8 & 1 & 2 \\ -1 & 10 & -1 \end{bmatrix}$ (d) $\begin{bmatrix} 8 & 1 & 2 \\ 1 & 10 & 1 \end{bmatrix}$

9) If $\begin{bmatrix} 4 & 3 & 2 \end{bmatrix}\begin{bmatrix} 1 \\ -2 \\ x \end{bmatrix}=[6]$,then x is

(a) 4 (b) 3 (c) 2 (d) 1

10) If $A=\begin{bmatrix} y & 0 \\ 3 & 4 \end{bmatrix}$ and $I=\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then $A^2=16I$ for:

(a) y=4 (b) y=5 (c) y=-4 (d) y=16

11) If P and Q are matrices, then which of the following is true?

(a) PQ≠QP (b) $(P^T)^T \neq P$ (c) P+Q≠Q+P (d) All are true

12) If $A=\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}_{3\times 2}$ $B=\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}_{2\times 3}$ then which of the following products can be made from these matrices

(i) A^2

(ii) B^2

(iii) AB

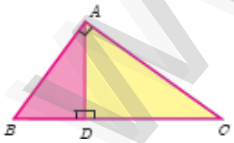
(iv) BA

(a) (i) only (b) (ii) and (iii) only (c) (iii) and (iv) only (d) all the above

13) If order of A,B,C are3 x 4, 5 x 4 and 5 x 8, then the order of (AB^TC) is

(a) 8 x 3 (b) 3 x 8 (c) 3 x 4 (d) 4 x 5

14) In the adjacent figure $\angle BAC$ = 90° and AD⊥BC then

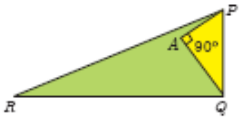


(a) BD-CD = BC^2 (b) AB.AC = BC^2 (c) BD.CD = AD^2 (d) AB-AC = AD^3

15) Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops?

(a) 13 m (b) 14 m (c) 15 m (d) 12.8 m

16) In the given figure PR = 26 cm, QR = 24cm, $\angle PAQ$ =90°, PA = 6cm and QA = 8 cm Find ∠PQR



(a) 80° (b) 85° (c) 75° (d) 90°

17) A tangent is perpendicular to the radius at the

(a) centre (b) point of contact (c) infinity (d) chord

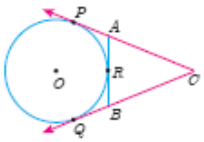
18) How many tangents can be drawn to the circle from an exterior point?

(a) one (b) two (c) infinite (d) zero

19) The two tangents from an external points P to a circle with centre at O are PA and PB.If $\angle APB$ = 70° then the value of $\angle AOB$ is

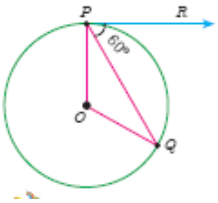
(a) 100° (b) 110° (c) 120° (d) 130°

20) In figure CP and CQ are tangents to a circle with centre at O. ARB is another tangent touching the circle at R. If CP = 11 cm and BC = 7 cm, then the length of BR is



(a) 6 cm (b) 5 cm (c) 8 cm (d) 4 cm

21) In figure if PR is tangent to the circle at P and O is the centre of the circle, then $\angle PQR$ is



(a) 120° (b) 100° (c) 110° (d) 90°

22) A line which intersects a circle at two distinct points is called

(a) point of contact (b) secant (c) diameter (d) tangent

23) If the angle between two radii of a circle is 130°, then the angle between the tangents at the end of the radii is

(a) 50° (b) 90° (c) 40° (d) 70°

24) Three circles are drawn with the vertices of a triangle as centres such that each circle touches the other two if the sides of the triangle are 2 cm, 3 cm and 4 cm, find the diameter of the smallest circle.

(a) 1 cm (b) 3 cm (c) 5 cm (d) 4 cm

25) If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}:1$ then the angle of elevation of the sun has measure

(a) 45° (b) 30° (c) 90° (d) 60°

26) The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point 'b' metres above the first, the depression of the foot of the tower is 60°. The height of the tower (in metres) is equal to

(a) $\sqrt{3}$ b (b) $\frac{b}{3}$ (c) $\frac{b}{2}$ (d) $\frac{b}{\sqrt{3}}$

27) A tower is 60 m height. Its shadow is x metres shorter when the sun's altitude is 45° than when it has been 30°, then x is equal to

(a) 41.92 m (b) 43.92 m (c) 43 m (d) 45.6 m

28) The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are 30° and 60° respectively. The height of the multistoried building and the distance between two buildings (in metres) is

(a) $20,10\sqrt{3}$ (b) $30,5\sqrt{3}$ (c) 20,10 (d) $30,10\sqrt{3}$

29) Two persons are standing 'x' metres apart from each other and the height of the first person is double that of the other. If from the middle point of the line joining their feet an observer finds the angular elevations of their tops to be complementary, then the height of the shorter person (in metres) is

(a) $\sqrt{2}$ x (b) $\frac{x}{2\sqrt{2}}$ (c) $\frac{x}{\sqrt{2}}$ (d) 2x

30) The angle of elevation of a cloud from a point h metres above a lake is β. The angle of depression of its reflection in the lake is 45°. The height of location of the cloud from the lake is

(a) $\frac{h(1+tan\beta)}{1-tan\beta}$ (b) $\frac{h(1-tan\beta)}{1+tan\beta}$ (c) h tan(45°-β) (d) none of these

31) The angle of elevation of the top of tree from a point at a distance of 250m from its base is 60°. The height of tree is :

(a) 250 m (b) $250\sqrt{3}$ (c) $\frac{250}{3}m$ (d) $200\sqrt{3}$

32) The angle of depression of a boat from a $50\sqrt{3}$ m high bridge is °.The horizontal distance of the boat from the bridge is:

(a) 150m (b) $150\sqrt{3}$ (c) 60m (d) $60\sqrt{3}$

33) From a given point when height of an object increases the angle of elevation_____

(a) increases (b) decreases (c) neither increases nor decreases (d) equal

34) If the angle of elevation of a tower from a distance of 100 m from its foot is 60°, then the height of the tower is

(a) $100\sqrt{3}m$ (b) $\frac{100}{\sqrt{3}}m$ (c) $50\sqrt{3}m$ (d) $\frac{200}{\sqrt{3}}m$

35) The angle of elevation of the top of tree from a point at a distance of 250 m from its base is 60° The height of the tree is

(a) 250 m (b) $250\sqrt{3}$ m (c) $\frac{250}{\sqrt{3}}$ m (d) $200\sqrt{3}$ m

36) The angle of depression of a boat from a $50\sqrt{3}$ m high bridge is 30°. The horizontal distance of the boat from the bridge is

(a) 150 m (b) $150\sqrt{3}$ m (c) 60 m (d) $60\sqrt{3}$ m

37) The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

(a) 60π cm^2 (b) 68π cm^2 (c) 120π cm^2 (d) 136π cm^2

38) If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

(a) $4\pi r^2$ sq.units (b) $6\pi r^2$ sq.units (c) $3\pi r^2$ sq.units (d) $8\pi r^2$ sq.units

39) Th e height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be

(a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm

40) If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

(a) 1:2 (b) 1:4 (c) 1:6 (d) 1:8

41) The total surface area of a cylinder whose radius is $\frac{1}{3}$of its height is

(a) $\frac{9\pi h^2}{8}$ sq.units (b) $24\pi h^2$ sq.units (c) $\frac{8\pi h^2}{9}$ sq.units (d) $\frac{56\pi h^2}{9}$ sq.units

42) In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is

(a) 5600π cm^3 (b) 11200π cm^3 (c) 56π cm^3 (d) 3600π cm^3

43) If the radius of the base of a cone is tripled and the height is doubled then the volume is

(a) made 6 times (b) made 18 times (c) made 12 times (d) unchanged

44) The total surface area of a hemi-sphere is how much times the square of its radius.

(a) π (b) 4π (c) 3π (d) 2π

45) A solid sphere of radius x cm is melted and cast into a shape of a solid cone of same radius. The height of the cone is

(a) 3 x cm (b) x cm (c) 4 x cm (d) 2x cm

46) A frustum of a right circular cone is of height 16cm with radii of its ends as 8cm and 20cm. Then, the volume of the frustum is

(a) 3328π cm^3 (b) 3228π cm^3 (c) 3240π cm^3 (d) 3340π cm^3

47) A shuttle cock used for playing badminton has the shape of the combination of

(a) a cylinder and a sphere (b) a hemisphere and a cone (c) a sphere and a cone

(d) frustum of a cone and a hemisphere

48) A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r^2 units. Then r_1 r_2: is

(a) 2:1 (b) 1:2 (c) 4:1 (d) 1:4

49) The volume (in cm^3) of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is

(a) $\frac{4}{3}\pi$ (b) $\frac{10}{3}\pi$ (c) 5π (d) $\frac{20}{3}\pi$

50) The height and radius of the cone of which the frustum is a part are h_1 units and r_1 units respectively. Height of the frustum is h_2 units and radius of the smaller base is r_2 units. If $h_2 : h_1 = 1:2$ then $r_2 : r_1$ is

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

51) The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is

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

52) The radio of base of a one 5 cm and to height 12cm. The slant height of the cone.

(a) 12cm (b) 17 cm (c) 7 cm (d) 60 cm

53) A cylinder 10 cone and have there are of a equal base and have the same height. what is the ratio of there volumes?

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

54) A solid frustum is of height 8 cm. If the radii of its lower and upper ends are 3 cm and 9 cmrespectively, then its slant height is:

(a) 15 cm (b) 12 cm (c) 10 cm (d) 17 cm

55) The curved surface area of a cylinder is 264 cm^2 and its volume is 924 cm^2.The ratio of diameter to its height is:

(a) 3:7 (b) 7:3 (c) 6:7 (d) 7:6

56) The total surface area of a hemisphere of radius 10cm is

(a) 942.86 cm^2 (b) 900 cm^2 (c) 300 cm^2 (d) 592.86 cm2

57) The volume of the sphere in 38808 cm^3, then its surface area is

(a) 5544 cm^2 (b) 4455 cm^2 (c) 4545 cm^2 (d) 5454 cm^2

58) If the volume of sphere is 36π cm^3, then its radius is equal to

(a) 3 cm (b) 2 cm (c) 5 cm (d) 10 cm

59) A cylinder circumscribes a sphere. The ratio of their volumes is

(a) 1 : 2 (b) 3 : 2 (c) 4 : 3 (d) 5 : 6

2 Marks

40 x 2 = 80

60) Construct a 3 x 3 matrix whose elements are $a_{ij} = i^2j^2$

61) Find the value of a, b, c, d from the equation $\begin{pmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{pmatrix} = \begin{pmatrix} 1 & 5 \\ 0 & 2 \end{pmatrix}$

62) In the matrix A = $\begin{bmatrix} 8 & 9 & 4 & 3 \\ -1 & \sqrt{7} & \frac{\sqrt{3}}{2} & 5 \\ 1 & 4 & 3 & 0 \\ 6 & 8 & -11 & 1 \end{bmatrix}$, write The number of elements

63) If A = $\begin{bmatrix} 5 & 4 & 3 \\ 1 & -7 & 9 \\ 3 & 8 & 2 \end{bmatrix}$ then find the transpose of A.

64) If A = $\begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$ then verify $(A^T)^T = A$

65) If A = $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$, B = $\begin{bmatrix} 1 & 7 & 0 \\ 1 & 3 & 1 \\ 2 & 4 & 0 \end{bmatrix}$, find A + B.

66) If A = $\begin{bmatrix} 5 & 4 & -2 \\ \frac{1}{2} & \frac{3}{4} & \sqrt{2} \\ 1 & 9 & 4 \end{bmatrix}$, B = $\begin{bmatrix} -7 & 4 & -3 \\ \frac{1}{4} & \frac{7}{2} & 3 \\ 5 & -6 & 9 \end{bmatrix}$, find 4A - 3B.

67) Find the value of a, b, c, d, from the following matrix equation.

$$\begin{bmatrix} d & 8 \\ 3b & a \end{bmatrix} + \begin{bmatrix} 3 & a \\ -2 & -4 \end{bmatrix} = \begin{bmatrix} 2 & 2a \\ b & 4c \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ -5 & 0 \end{bmatrix}$$

68) If A = $\begin{bmatrix} 1 & 2 & 0 \\ 3 & 1 & 5 \end{bmatrix}$, B = $\begin{bmatrix} 8 & 3 & 1 \\ 2 & 4 & 1 \\ 5 & 3 & 1 \end{bmatrix}$, find AB.

69) Find the order of the product matrix AB if

	(i)	(ii)	(iii)	(iv)	(v)
Orders of A	3 x 3	4 x 3	4 x 2	4 x 5	1 x 1
Orders of B	3 x 3	3 x 2	2 x 2	5 x 1	1 x 3

70) If A = $\begin{bmatrix} 2 & 5 \\ 4 & 3 \end{bmatrix}$, B = $\begin{bmatrix} 1 & -3 \\ 2 & 5 \end{bmatrix}$ find AB, BA and check if AB = BA?

71) If A = $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ prove that $AA^T = I$.

72) Find the values of x, y and z from the following equations.

$$\begin{bmatrix} x+y & 2 \\ 5+x & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$$

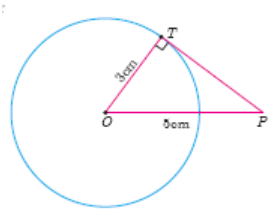
73) Find the values of x, y and z from the following equations.

$$\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$$

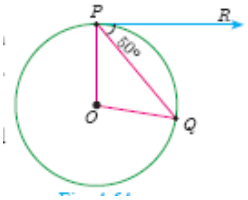
74) Determine the entries denoted by a_{11}, a_{22}, a_{33}, a_{44} from the matrix

$$\begin{bmatrix} 2 & 1 & 3 & 4 \\ 5 & 9 & -4 & \sqrt{7} \\ 3 & 5/2 & 8 & 9 \\ 7 & 0 & 1 & 4 \end{bmatrix}$$

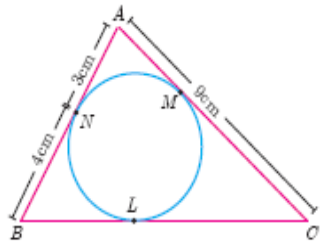
75) Find the length of the tangent drawn from a point whose distance from the centre of a circle is 5 cm and radius of the circle is 3 cm.



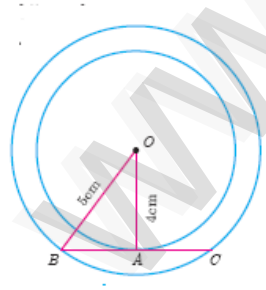
76) In Figure, O is the centre of a circle. PQ is a chord and the tangent PR at P makes an angle of 50° with PQ. Find ∠POQ,



77) In Fig, △ ABC is circumscribing a circle. Find the length of BC.

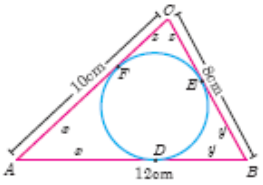


78) If radii of two concentric circles are 4 cm and 5 cm then find the length of the chord of one circle which is a tangent to the other circle



79) The length of the tangent to a circle from a point P, which is 25 cm away from the centre is 24 cm. What is the radius of the circle?

80) A circle is inscribed in △ABC having sides 8 cm, 10 cm and 12 cm as shown in figure, find AD, BE and CF.



81) A tangent ST to a circle touches it at B. AB is a chord such that ∠ABT= 65°. Find ∠AOB , where "O" is the centre of the circle.

82) Check whether AD is bisector ∠A of △ABC in each of the following AB = 4cm, AC = 6cm, BD = 1.6cm and CD = 2.4cm.

83) A tower stands vertically on the ground. from a point on the ground,which is 48m away from the foot of the tower, the angel of elevation of the top of the tower is 30°.find the hieght of the tower.

84) Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height $10\sqrt{3}m$

85) A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60° . Find the distance between the foot of the tower and the ball.($\sqrt{3}$ =1.732)

86) A cylindrical drum has a height of 20 cm and base radius of 14 cm. Find its curved surface area and the total surface area.

87) The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2 . Find the diameter of the cylinder.

88) A garden roller whose length is 3 m long and whose diameter is 2.8 m is rolled to level a garden. How much area will it cover in 8 revolutions?

89) The radius of a conical tent is 7 m and the height is 24 m. Calculate the length of the canvas used to make the tent if the width of the rectangular canvas is 4 m?

90) If the total surface area of a cone of radius 7cm is 704 cm^2, then find its slant height.

91) Find the diameter of a sphere whose surface area is 154 m^2.

92) If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area?

93) The slant height of a frustum of a cone is 5 cm and the radii of its ends are 4 cm and 1 cm. Find its curved surface area.

94) The radius of a sphere increases by 25%. Find the percentage increase in its surface area.

95) The volume of a solid right circular cone is 11088 cm^3. If its height is 24 cm then find the radius of the cone.

96) A 14 m deep well with inner diameter 10 m is dug and the earth taken out is evenly spread all around the well to form an embankment of width 5 m. Find the height of the embankment.

97) If the circumference of a conical wooden piece is 484 cm then find its volume when its height is 105 cm.

98) If the ratio of radii of two spheres is 4 : 7, find the ratio of their volumes.

99) Find the surface area of the earth whose diameter is 12756 kms.

5 Marks

50 x 5 = 250

100) Construct a 3 x 3 matrix whose elements are given by $a_{ij} = |i - 2j|$

101) Find X and Y if $X + Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

102) Find the values of x, y, z if $\begin{bmatrix} x-3 & 3x-z \\ x+y+7 & x+y+z \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 1 & 6 \end{bmatrix}$

103) Find x and y if $x\begin{bmatrix} 4 \\ -3 \end{bmatrix} + y\begin{bmatrix} -2 \\ 3 \end{bmatrix} = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$

104) Find the non-zero values of x satisfying the matrix equation $x\begin{bmatrix} 2x & 2 \\ 3 & x \end{bmatrix} + 2\begin{bmatrix} 8 & 5x \\ 4 & 4x \end{bmatrix} = 2\begin{bmatrix} x^2+8 & 24 \\ 10 & 6x \end{bmatrix}$

105) Solve for x, y : $\begin{bmatrix} x^2 \\ y^2 \end{bmatrix} + 2\begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} -5 \\ 8 \end{bmatrix}$

106) If $A = \begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}$ find AB and BA. Check if AB = BA

107) Solve $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$

108) If $A = \begin{bmatrix} 1 & -1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$ show that (AB)C = A(BC)

109) If $A = \begin{bmatrix} 1 & 1 \\ -1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ -4 & 2 \end{bmatrix}$, $C = \begin{bmatrix} -7 & 6 \\ 3 & 2 \end{bmatrix}$ verify that A(B + C) = AB + AC

110) If $A = \begin{bmatrix} 1 & 2 & 1 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 \\ -1 & 4 \\ 0 & 2 \end{bmatrix}$ show that $(AB)^T = B^TA^T$

111) Given that $A = \begin{bmatrix} 1 & 3 \\ 5 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & 2 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 3 & 2 \\ -4 & 1 & 3 \end{bmatrix}$ verify that A(B + C) = AB + AC.

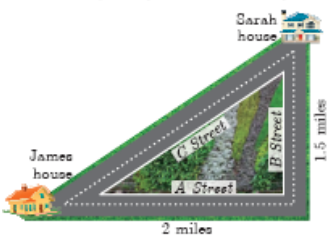
112) Let $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$ Show that A(BC) = (AB)C

113) If $A = \begin{bmatrix} \cos\theta & 0 \\ 0 & \cos\theta \end{bmatrix}$, $B = \begin{bmatrix} \sin\theta & 0 \\ 0 & \sin\theta \end{bmatrix}$ then show that $A^2 + B^2 = 1$.

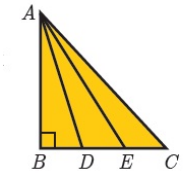
114) If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ show that $A^2 - (a + d) A = (bc - ad)I_2$

115) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I_2 = 0$

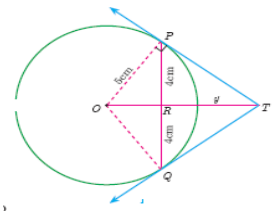
116) There are two paths that one can choose to go from Sarah's house to James house. One way is to take C street, and the other way requires to take B street and then A street.How much shorter is the direct path along C street? (Using figure).



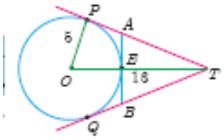
117) In the adjacent figure, ABC is a right angled triangle with right angle at B and points D, E trisect BC. Prove that $8AE^2 = 3AC^2 + 5AD^2$



118) PQ is a chord of length 8 cm to a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length of the tangent TP.

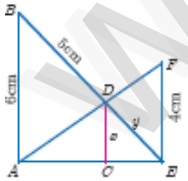


119) In figure, O is the centre of the circle with radius 5 cm. T is a point such that OT = 13 cm and OT intersects the circle E, if AB is the tangent to the circle at E, find the lenght of AB



120) Show that the angle bisectors of a triangle are concurrent.

121) In the given figure AB || CD || EF.If AB = 6cm, CD = x cm, EF = 4 cm, BD = 5 cm and DE = y can.Final x and y



122) State the Pythagoras Theorem

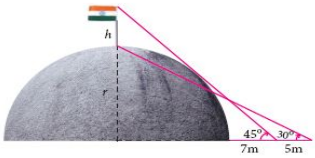
123) Two ships are sailing in the sea on either sides of a lighthouse as observed from the ships are 30° and 45° respectively. if the lighthouse is 200 m high,find the distance between the two ships. $(\sqrt{3} = 1.732)$

124) From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 30m high building are 45° and 60° respectively. find the hieght of the tower. $(\sqrt{3} = 1.732)$

125) To a man standing outside his house, the angles of elevation of the top and bottom of a window are 60° and 45° respectively. If the height of the man is 180 cm and if he is 5 m away from the wall, what is the height of the window?($\sqrt{3}$ = 1.732)

126) A statue 1.6 m tall stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 40°. Find the height of the pedestal.(tan40° = 0.8391,$\sqrt{3}$ = 1.732)

127) A flag pole of height 'h' metres is on the top of the hemispherical dome of radius 'r' metres. A man is standing 7 m away from the dome. Seeing the top of the pole at an angle 45° and moving 5 m away from the dome and seeing the bottom of the pole at an angle 30°. Find (i) the height of the pole (ii) radius of the ($\sqrt{3}$ =1.732)

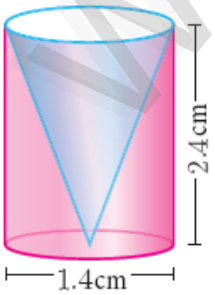


128) From the top of the tower 60 m high the angles of depression of the top and bottom of a vertical lamp post are observed to be 38° and 60° respectively. Find the height of the lamp post (tan38° = 0.7813,$\sqrt{3}$ = 1.732)

129) An aeroplane at an altitude of 1800 m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats.($\sqrt{3}$ = 1.732)

130) A man is standing on the deck of a ship, which is 40 m above water level. He observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . Calculate the distance of the hill from the ship and the height of the hill. ($\sqrt{3}$ = 1.732)

131) From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and base is hollowed out. Find the total surface area of the remaining solid.



132) The radius and height of a cylinder are in the ratio 5 : 7 and its curved surface area is 5500 sq.cm. Find its radius and height.

133) A solid iron cylinder has total surface area of 1848 sq.m. Its curved surface area is five – sixth of its total surface area. Find the radius and height of the iron cylinder.

134) The internal and external diameters of a hollow hemispherical vessel are 20 cm and 28 cm respectively. Find the cost to paint the vessel all over at Rs. 0.14 per cm^2.

135) The frustum shaped outer portion of the table lamp has to be painted including the top part. Find the total cost of painting the lamp if the cost of painting 1 sq.cm is Rs.2.

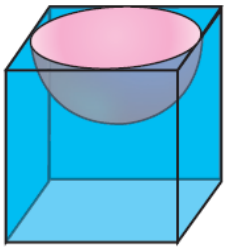
136) Find the volume of the iron used to make a hollow cylinder of height 9 cm and whose internal and external radii are 21 cm and 28 cm respectively

137) If the radii of the circular ends of a frustum which is 45 cm high are 28 cm and 7 cm, find the volume of the frustum.

138) The volumes of two cones of same base radius are 3600 cm^3 and 5040 cm^3. Find the ratio of heights.

139) The outer and the inner surface areas of a spherical copper shell are 576π cm^2 and 324π cm^2 respectively. Find the volume of the material required to make the shell.

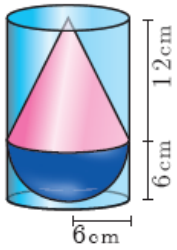
140) A hemispherical section is cut out from one face of a cubical block such that the diameter l of the hemisphere is equal to side length of the cube. Determine the surface area of the remaining solid.



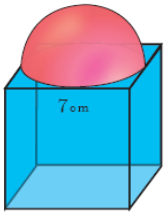
141) A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter is 14 cm and the height of the vessel is 13 cm. Find the capacity of the vessel.

142) A solid consisting of a right circular cone of height 12 cm and radius 6 cm standing on a hemisphere of radius 6 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of the water displaced out of

the cylinder, if the radius of the cylinder is 6 cm and height is 18 cm.



143) As shown in figure a cubical block of side 7 cm is surmounted by a hemisphere. Find the surface area of the solid.



144) A metallic sphere of radius 16 cm is melted and recast into small spheres each of radius 2 cm. How many small spheres can be obtained?

145) A cone of height 24 cm is made up of modeling clay. A child reshapes it in the form of a cylinder of same radius as cone. Find the height of the cylinder.

146) An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.

147) The internal and external diameter of a hollow hemispherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, then find the height of the cylinder.

148) The slant height of a frustum of a cone is 4 m and the perimeter of circular ends are 18 m and 16 m. Find the cost of painting its curved surface area at Rs.100 per sq. m

149) The volume of a cone is $1005\frac{5}{7}$cu. cm. The area of its base is $201\frac{1}{7}$sq. cm. Find the slant height of the cone.

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