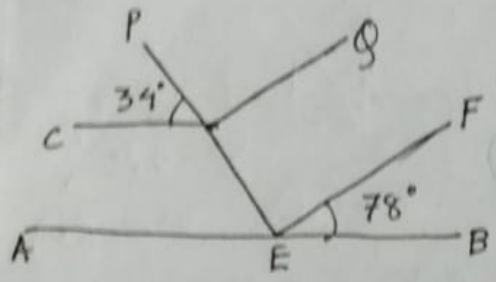
[9]

(A) GEOMETRY
(B) TRIGONOMETRY
(C) 3D FIGURES
(D) 2D FIGURES
(E) ALGEBRA

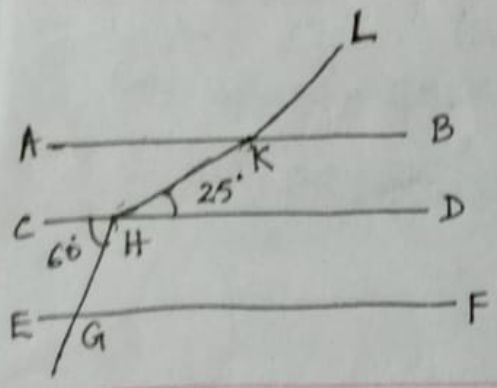
{ (A) GEOMETRY } ⟨1⟩

1. In the given figure AB ∥ CD and EF ∥ DG; Find the Value of ∠DEF:

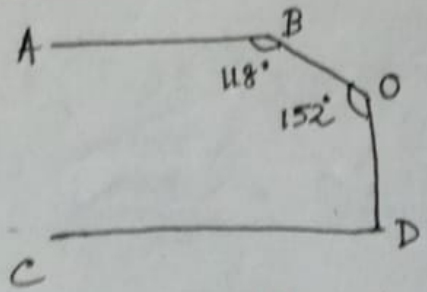


(a) 68° (b) 78°
(c) 34° (d) 39°

2. In the given figure AB ∥ CD ∥ EF and GH ∥ KL.
Find ∠HKL:



(a) 85° (b) 145°
(c) 120° (d) 95°

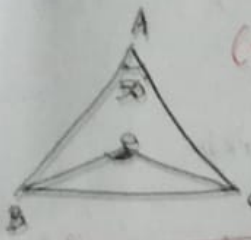
3. 

AB ∥ CD ; ∠ABO = 118° ;
∠BOD = 152° ; find ∠ODC ;

(a) 70° (b) 80° (c) 90° (d) 34°

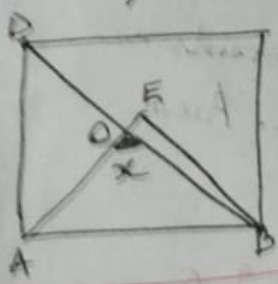
[9] GEOMETRY (A) <2>

4. In the given figure; BO and CO are the bisectors of ∠B and ∠C respectively. If ∠A = 50°; then ∠BOC = ?



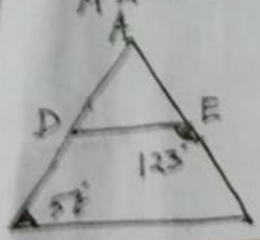
(a) 130° (b) 100° (c) 115° (d) 120°

5. In the given figure ▲ABE is an equilateral triangle in a square ABCD. Find the value of angle x in degrees:



(a) 60° (b) 45°
(c) 75° (d) 90°

6. In the given figure; AD = 12 cm; AB = 20 cm and AE = 10 cm. Find EC:



(a) 14 cm (b) 10 cm
(c) 8 cm (d) 15 cm

7. The three medians AD, BE and CF of ▲ABC intersect at point G. If the area of ▲ABC is 60 sq.cm; then the area of the quadrilateral BDGF is:

(a) 10 sq.cm (b) 15 sq.cm (c) 20 sq.cm (d) 30 sq.cm

8. In $\triangle ABC$; AD is the internal bisectors of $\angle A$; meeting the side BC at D. If BD = 5 cm; BC = 7.5 cm then AB : AC is

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

9. In the given figure, O is the centre of a circle in which $\angle AOC = 100°$. Side AB of quadrilateral OABC has been produced to D. Then; $\angle CBD = ?$

(a) 50° (b) 40° (c) 25° (d) 80°

10. A chord AB of length $3\sqrt{2}$ unit subtends a right angle at the centre O of a circle. Area of the Sector AOB (in sq. units) is

(a) $\frac{9}{4}\pi$ (b) 5π (c) 9π (d) $\frac{9}{2}\pi$

[6] TRIGONOMETRY (B) (4)

1. If $\tan(x+y)\tan(x-y) = 1$; then the value of $\tan\left(\frac{\pi x}{3}\right)$ is

(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{2}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) 1

2. If $A = \tan 11^\circ \tan 29^\circ$; $B = 2\cot 61^\circ \cdot \cot 79^\circ$; then:

(a) $A = 2B$ (b) $A = -2B$ (c) $2A = B$ (d) $2A = -B$

3. If $\sin\theta + \cos\theta = p$ and $\sec\theta + \operatorname{cosec}\theta = q$; then $\frac{p^2-1}{p^2+1} = ?$

(a) $\sin\theta$ (b) $\cos\theta$ (c) $\sec\theta$ (d) $\tan\theta$

4. $\left(1 + \cot\theta - \operatorname{cosec}\theta\right)\left(1 + \tan\theta + \sec\theta\right) = ?$

(a) 1 (b) 3 (c) 2 (d) 0

5. If $\cot\theta\left(1+\sin\theta\right) = 4m$ and $\cot\theta\left(1-\sin\theta\right) = 4n$; then $\left(m^2 - n^2\right) = ?$

(a) m^2n^2 (b) m^3n^3 (c) mn (d) m^2n

6. $3\left(\sin x - \cos x\right)^4 + 6\left(\sin x + \cos x\right)^2 + 4\left(\sin^6 x + \cos^6 x\right) = ?$

(a) 11 (b) 12 (c) 10 (d) 13

7. $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} + \sqrt{\frac{1-\cos\theta}{1+\cos\theta}} = ?$

(a) $2\sin\theta$ (b) $2\cos\theta$ (c) $2\sec\theta$ (d) $2\operatorname{cosec}\theta$

8. $\cos\theta + \sec\theta = \sqrt{3}$; then the value of $\cos^3\theta + \sec^3\theta$ is:

(a) 0 (b) 1 (c) -1 (d) $\sqrt{3}$

9. The angles of depression of two ships from the top of the light house are 45° and 30° towards east. If the ships are 100 m apart; then the height of the light house is:

(a) $50(\sqrt{3}-1)$ m (b) $50(\sqrt{3}+1)$ m

(c) $50\sqrt{3}$ m (d) $\frac{50}{\sqrt{3}-1}$

10. From the top of a tower a guard saw a prisoner on the ground at an angle of depression of 60°. If the prisoner is 80m away from the foot of the tower, the distance between the guard and the prisoner is:

(a) 120 m (b) 160 m (c) 170m (d) 150m

1. Find the number of spherical balls of radious 1 cm that can be made from a cylinder of height 8 cm and diameter 14 cm?

(a) 284 (b) 294 (c) 304 (d) 314

2. If the height and the radious of the base of a cone are each increased by 100%; then the Volume of the cone becomes:

(a) Twice the Original (b) Four times the Original
(c) Eight times the Original (d) Six times the Original

3. The height of a cone is 60 cm. A small cone is cutoff at the top by a plane parallel to its base. If its Volume is $\frac{1}{64}$ of the Volume of the cone, at what height above the base is the section made?

(a) 17 cm (b) 20cm (c) 23 cm (d) 15cm

4. A bottle in shape of a right circular cone of height 21 cm is filled will water. The water is poured in right circular cylindrical bottle whose radious is one third of the radious of the circular cone. The height of the water in the bottle is

(a) 72 cm (b) 54 cm (c) 63 cm (d) 48 cm

5. The ratio of the Side of the room is 5:2; the cost of Whitewashing the ceiling of the room at 50 paise per square metre is ₹ 2500 and the cost of preparing the Walls at 30 paise per square metre is ₹ 2100. The height of the room is:

(a) 31m (b) 36m (c) 23m (d) 20m

6. How many bricks; each measuring 20cm × 8cm × 5cm; will be needed to build a Wall of 10m × 7m × 20cm?

(a) 16000 (b) 11000 (c) 12000 (d) 17500

7. If the length, breadth and height of a hall is 14m; 8m; 8m; then find the diagonal of the hall?

(a) 15m (b) 17m (c) 19m (d) 18m

8. The area of the sheet required to prepare an 600m height of a cone with base radious 32 cm. (in cm^2)

(a) 13862 cm^2 (b) 15851 cm^2 (c) 14960 cm^2 (d) 12873 cm^2

9. 5m radious and 12m height Solid metallic cylinder is melted and recast into Small spherical balls of radious 5m. Find the no of balls that can be made?

(a) 3 (b) 2 (c) 1 (d) 5

10. Two cubes have their Volume in the ratio 1:8; find the ratio of their Surface area?

(a) 2:5 (b) 1:1 (c) 1:4 (d) 3:7

1. The area of a square is 7 sqcm less than half of the area of a rectangle. The length of the rectangle is 14cm and breadth is 6cm less less than its length. What is the perimeter of the square?

(a) 42 cm (b) 32 cm (c) 22 cm (d) 28cm

2. Inside a square plot a circular garden is developed which exactly fits in the square plot and the diameter of the garden is equal to the side of the square plot which is 14m. What is the area of the space leftout in the square plot after developing the garden?

(a) 32 m^2 (b) 40 m^2 (c) 42 m^2 (d) 35 m^2

3. How many marbles of 10 cm length and 7cm Width are required to pave the floor of room 7m length and 4m breadth?

(a) 4000 (b) 5100 (c) 2800 (d) 3200

4 A circle is drawn circumscribing a rectangle of sides 8 cm and 6 cm; find the area of the circle. (in cm^2):

(a) 78.5 (b) 82.7 (c) 65.4 (d) 54.9

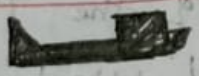
[9] 2D FIGURES (1) (9)

5. If the sides of an equilateral triangle is increased by 10%; 30% and 60%; then a new triangle is formed. By what percent perimeter of the triangle is increased?

(a) 40.50% (b) 32.45% (c) 33.33% (d) 35.67%

6. The number of rounds that a Wheel of diameter 14m will make in going 2km is:

(a) 62 (b) 50 (c) 45 (d) 56

7. In a parallelogram the  length of adjacent sides are 13m and 11m. If the length of one diagonal is 18m, find the length of the other diagonal?

(a) 9m (b) 16m (c) 12m (d) 19m

8. The Circumference of the 2 circle is 212 cm and 412 cm. What is the difference between the area of the 2 circles?

(a) 10057 cm^2 (b) 10480 cm^2 (c) 10070 cm^2

(d) 10140 cm^2

9. If the length of the rectangular field is increased by 10% and the breadth is reduced by 10%; now the area of rectangle will be 217 cm². Find the area of the Original rectangle?

(a) 210 cm² (b) 219 cm² (c) 215 cm² (d) 221 cm²

10. The perimeter of a rhombus is [redacted] cm. If one of its diagonals is 16 cm; then the area of the rhombus is:

(a) 108 cm² (b) 84 cm² (c) 72 cm² (d) [redacted] cm²

[9.] ALGEBRA (E) <11>

1. If $\frac{7x}{2} + 14 = \frac{7}{x}$; then What will be the Value of $\frac{x^2}{4} + \frac{1}{x^2} = ?$

(a) 5 (b) 15 (c) 7 (d) 17

2. If $\frac{3P}{P^2-3P+3} = \frac{1}{6}$; $P \neq 0$; then find the Value of $\left(P + \frac{3}{P}\right)$:

(a) 20 (b) 21 (c) 22 (d) 25

3. If $x(x+y+z) = 20$; $y(x+y+z) = 30$ and $z(x+y+z) = 50$; then the Value of $2(x+y+z)$ is

(a) 20 (b) −10 (c) 15 (d) 18

4. If $a^x = (x+y+z)^y$; $a^y = (x+y+z)^z$ and $a^z = (x+y+z)^x$; then the Value of $x+y+z$ (Given $a \neq 0$) is

(a) 0 (b) a^3 (c) 1 (d) a

5. If $x = 2+\sqrt{3}$; the value of $\frac{x^6 + x^4 + x^2 + 1}{x^3}$ is

(a) 65 (b) 156 (c) 69 (d) 67

6. If $x = 2t$ and $y = \frac{2t-1}{3}$; then what is the value of t for which $x = y$ holds?

(a) $\frac{1}{4}$ (b) $-\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $-\frac{1}{4}$

7. If $2a - \frac{2}{a} + 3 = 0$; then the value of $\left(a^3 - \frac{1}{a^3} + 2\right)$ is :

(a) 5 (b) $-\frac{35}{8}$ (c) $-\frac{40}{7}$ (d) $-\frac{47}{8}$

8. If $x^2 + y^2 = 35$ and $x + y = 5$; the value of $\left(\frac{1}{x} + \frac{1}{y}\right)$ is

(a) $\frac{4}{7}$ (b) $\frac{3}{8}$ (c) $\frac{5}{6}$ (d) $\frac{3}{5}$

9. If $\frac{x^2}{by+cz} = \frac{y^2}{cz+ax} = \frac{z^2}{ax+by} = 1$; then the value of $\frac{a}{a+x} + \frac{b}{b+y} + \frac{c}{c+z}$ is

(a) -1 (b) 2 (c) 1 (d) -2

10. If a, b, c are three non-zero real numbers such that $a+b+c=0$ and $b^2 \neq ca$; then the value of $\frac{a^2+b^2+c^2}{b^2-ca}$ is

(a) 3 (b) 2 (c) 0 (d) 1