1. What is $(\tan x + \tan y)(1 - \cot x \cot y) + (\cot x + \cot y)(1 - \tan x \tan y)$ equal to ?

(a) 0

(b) 1

(c) 2

(d) 4

2. What is $\sqrt{\dfrac{\sec x - \tan x}{\sec x + \tan x}}$ equal to ?

(a) $\dfrac{1}{\sin x + \cos x}$

(b) $\dfrac{1}{\tan x + \cot x}$

(c) $\dfrac{1}{\sec x + \tan x}$

(d) $\dfrac{1}{\csc x + \cot x}$

3. If $\theta$ lies in the first quadrant and $\cot\theta = \dfrac{63}{16}$, then what is the value of $(\sin\theta + \cos\theta)$ ?

(a) 1

(b) $\dfrac{69}{65}$

(c) $\dfrac{79}{65}$

(d) 2

4. What is the value of $\dfrac{1 - 2\sin^2\theta\cos^2\theta}{\sin^4\theta + \cos^4\theta} + 4$ equal to ?

(a) 0

(b) 1

(c) 2

(d) 5

5. A rectangle is 48 cm long and 14 cm wide. If the diagonal makes an angle $\theta$ with the longer side, then what is $(\sec\theta + \csc\theta)$ equal to ?

(a) $\dfrac{775}{168}$

(b) $\dfrac{725}{168}$

(c) $\dfrac{375}{84}$

(d) $\dfrac{325}{84}$

6. What is the area of the triangle having side lengths $\dfrac{y}{z} + \dfrac{z}{x}, \dfrac{z}{x} + \dfrac{x}{y}, \dfrac{x}{y} + \dfrac{y}{z}$ ?

(a) $\dfrac{(x + y + z)^2}{xyz}$

(b) $\dfrac{\sqrt{xyz}}{x + y + z}$

(c) $\sqrt{\dfrac{x}{y} + \dfrac{y}{z} + \dfrac{z}{x}}$

(d) $\sqrt{\dfrac{xy + yz + zx}{xyz}}$

3

7. If the angles of a triangle are 30° and 45° and the included side is $(\sqrt{3}+1)$ cm, then what is the area of the triangle ?

(a) $(\sqrt{3}+1)$ cm²

(b) $(\sqrt{3}+3)$ cm²

(c) $\frac{1}{2}(\sqrt{3}+1)$ cm²

(d) $2(\sqrt{3}+1)$ cm²

8. ABCD is a plate in the shape of a parallelogram. EF is the line parallel to DA and passing through the point of intersection O of the diagonals AC and BD. Further, E lies on DC and F lies on AB. The triangular portion DOE is cut out from the plate ABCD. What is the ratio of area of remaining portion of the plate to the whole ?

(a) $\frac{5}{8}$

(b) $\frac{5}{7}$

(c) $\frac{3}{4}$

(d) $\frac{7}{8}$

9. Two circles of radii 20 cm and 16 cm intersect and the length of common chord is 24 cm. If $d$ is the distance between their centres, then which one of the following is correct ?

(a) $d < 26$ cm

(b) $26$ cm $< d < 27$ cm

(c) $27$ cm $< d < 28$ cm

(d) $d > 28$ cm

10. In a circle of radius 5 cm, AB and AC are two chords such that AB = AC = 8 cm. What is the length of chord BC ?

(a) 9 cm

(b) 9·2 cm

(c) 9·6 cm

(d) 9·8 cm

11. Two circles touch internally. The sum of their areas is $136\pi$ cm² and distance between their centres is 4 cm. What are the radii of the circles ?

(a) 11 cm, 7 cm

(b) 10 cm, 6 cm

(c) 9 cm, 5 cm

(d) 8 cm, 4 cm

12. If area of a circle and a square are same, then what is the ratio of their perimeters ?

(a) $2\sqrt{\pi}$

(b) $\sqrt{\pi}$

(c) $\frac{\sqrt{\pi}}{2}$

(d) $\frac{\sqrt{\pi}}{4}$

5

D – PLKI-T-MTK

13. A circle of diameter 8 cm is placed in such a manner that it touches two perpendicular lines. Then another smaller circle is placed in the gap such that it touches the lines and the circle. What is the diameter of the smaller circle ?

(a) $4(3-\sqrt{2})$ cm

(b) $4(3-2\sqrt{2})$ cm

(c) $8(3-\sqrt{2})$ cm

(d) $8(3-2\sqrt{2})$ cm

14. The thickness of a cylinder is 1 foot, the inner radius of the cylinder is 3 feet and height is 7 feet. To paint the inner surface it requires one litre of a particular colour. How much quantity of the same colour is required to paint all the surfaces of the cylinder ?

(a) $\frac{7}{3}$ litre

(b) $\frac{3}{2}$ litre

(c) $\frac{8}{3}$ litre

(d) $\frac{10}{3}$ litre

15. A square and a rectangle have equal areas. If one side of the rectangle is of length numerically equal to the square of the length of the side of the square then the other side of the rectangle is

(a) square root of the side of the square

(b) half the side of the square

(c) of unit length

(d) double the side of the square

16. The number $2 \times 3 \times 5 \times 7 \times 11 + 1$ is

(a) a prime number

(b) not a prime, but power of a prime

(c) not a power of a prime, but a composite even number

(d) not a power of a prime, but a composite odd number

17. Two unequal pairs of numbers satisfy the following conditions :

(i) The product of the two numbers in each pair is 2160

(ii) The HCF of the two numbers in each pair is 12.

If $x$ is the mean of the numbers in the first pair and $y$ is the mean of the numbers in the second pair, then what is the mean of $x$ and $y$ ?

(a) 60

(b) 72

(c) 75

(d) 78

18. How many digits are there in $(54)^{10}$ ? (Given that $\log_{10}2 = 0.301$ and $\log_{10}3 = 0.477$)

(a) 16

(b) 18

(c) 19

(d) 27

7

19. Which one of the following is a set of solutions of the equation $x^{\sqrt{x}} = \sqrt[n]{x^x}$, if $n$ is a positive integer?

(a) $\{1, n^2\}$

(b) $\{1, \sqrt{n}\}$

(c) $\{1, n\}$

(d) $\{n, n^2\}$

20. In a competitive examination, 250 students have registered. Out of these, 50 students have registered for Physics, 75 students for Mathematics and 35 students for both Mathematics and Physics. What is the number of students who have registered neither for Physics nor for Mathematics?

(a) 90

(b) 100

(c) 150

(d) 160

21. If the sum of the digits of a number $10^n - 1$, where $n$ is a natural number, is equal to 3798, then what is the value of $n$?

(a) 421

(b) 422

(c) 423

(d) 424

22. Which one of the following is the largest number among $2222^2$, $222^{22}$, $22^{222}$, $2^{2222}$?

(a) $2^{2222}$

(b) $22^{222}$

(c) $222^{22}$

(d) $2222^2$

23. If $m$ is the number of prime numbers between 0 and 50; and $n$ is the number of prime numbers between 50 and 100, then what is $(m - n)$ equal to?

(a) 4

(b) 5

(c) 6

(d) 7

24. If $\dfrac{a}{b} = \dfrac{1}{3}$, $\dfrac{b}{c} = 2$, $\dfrac{c}{d} = \dfrac{1}{2}$, $\dfrac{d}{e} = 3$ and $\dfrac{e}{f} = \dfrac{1}{4}$, then what is the value of $\dfrac{abc}{def}$?

(a) $\dfrac{1}{4}$

(b) $\dfrac{3}{4}$

(c) $\dfrac{3}{8}$

(d) $\dfrac{27}{4}$

25. Which one of the following is the largest divisor of $3^x + 3^{x+1} + 3^{x+2}$, if $x$ is any natural number?

(a) 3

(b) 13

(c) 39

(d) 117

9

26. A two-digit number is 9 more than four times of the number obtained by interchanging its digits. If the product of digits in the two-digit number is 8, then what is the number?

(a) 81

(b) 42

(c) 24

(d) 18

27. If $\alpha$ and $\beta$ are the roots of the quadratic equation $x^2 + kx - 15 = 0$ such that $\alpha - \beta = 8$, then what is the positive value of $k$?

(a) 2

(b) 3

(c) 4

(d) 5

28. What are the values of $p$ and $q$ respectively, if $(x-1)$ and $(x+2)$ divide the polynomial $x^3 + 4x^2 + px + q$?

(a) 1, −6

(b) 2, −6

(c) 1, 6

(d) 2, 6

29. If $(x+k)$ is the HCF of $x^2 + 5x + 6$ and $x^2 + 8x + 15$, then what is the value of $k$?

(a) 5

(b) 3

(c) 2

(d) 1

30. If $5^{x+1} - 5^{x-1} = 600$, then what is the value of $10^{2x}$?

(a) 1

(b) 1000

(c) 100000

(d) 1000000

31. If the annual income of $X$ is 20% more than that of $Y$, then the income of $Y$ is less than that of $X$ by $p\%$. What is the value of $p$?

(a) 10

(b) $16\frac{2}{3}$

(c) $17\frac{1}{3}$

(d) 20

32. What is the least perfect square which is divisible by 3, 4, 5, 6 and 7?

(a) 1764

(b) 17640

(c) 44100

(d) 176400

33. In a water tank there are two outlets. It takes 20 minutes to empty the tank if both the outlets are opened. If the first outlet is opened, the tank is emptied in 30 minutes. What is the time taken to empty the tank by second outlet?

(a) 30 minutes

(b) 40 minutes

(c) 50 minutes

(d) 60 minutes

11

34. If $(x^2 - 1)$ is a factor of
$ax^4 + bx^3 + cx^2 + dx + e$,
then which one of the following is correct?

(a) $a + b + c = d + e$

(b) $a + b + e = c + d$

(c) $b + c + d = a + e$

(d) $a + c + e = b + d$

35. If $\left(x^8 + \dfrac{1}{x^8}\right) = 47$, what is the value of $\left(x^6 + \dfrac{1}{x^6}\right)$?

(a) 36

(b) 27

(c) 18

(d) 9

36. A wheel makes 360 revolutions in one minute. What is the number of radians it turns in one second?

(a) $4\pi$

(b) $6\pi$

(c) $12\pi$

(d) $16\pi$

37. What is the least value of $(25 \operatorname{cosec}^2 x + \sec^2 x)$?

(a) 40

(b) 36

(c) 26

(d) 24

38. Let $0 < \theta < 90°$ and $100\theta = 90°$. If $\alpha = \prod_{n=1}^{99} \cot n\theta$, then which one of the following is correct?

(a) $\alpha = 1$

(b) $\alpha = 0$

(c) $\alpha > 1$

(d) $0 < \alpha < 1$

39. If $\tan 6\theta = \cot 2\theta$, where $0 < 6\theta < \dfrac{\pi}{2}$, then what is the value of $\sec 4\theta$?

(a) $\sqrt{2}$

(b) 2

(c) $\dfrac{2}{\sqrt{3}}$

(d) $\dfrac{4}{3}$

40. A tree of height 15 m is broken by wind in such a way that its top touches the ground and makes an angle $30°$ with the ground. What is the height from the ground to the point where tree is broken?

(a) 10 m

(b) 7 m

(c) 5 m

(d) 3 m

13
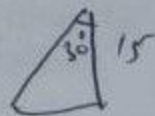
**41.** On a plane area there are two vertical towers separated by 100 feet apart. The shorter tower is 40 feet tall. A pole of length 6 feet stands on the line joining the base of two towers so that the tip of the towers and tip of the pole are also on the same line. If the distance of the pole from the shorter tower is 75 feet, then what is the height of the taller tower (approximately)?

(a) 85 feet

(b) 110 feet

(c) 125 feet

(d) 140 feet

**42.** The angles of elevation of the top of a tower from two points at distances $p$ and $q$ from the base and on the same straight line are $27°$ and $63°$ respectively. What is the height of the tower?

(a) $pq$

(b) $\sqrt{pq}$

(c) $\dfrac{pq}{2}$

(d) $\dfrac{\sqrt{pq}}{2}$

**43.** What is the value of
$$\sin^2 6° + \sin^2 12° + \sin^2 18° + \dots + \sin^2 84° + \sin^2 90° ?$$

(a) 1

(b) 2

(c) 4

(d) 8

**44.** What is $\dfrac{\cos\theta}{1+\sin\theta} + \dfrac{1}{\cot\theta}$ equal to?

(a) $\operatorname{cosec}\theta$

(b) $\sec\theta$

(c) $\sec\theta + \operatorname{cosec}\theta$

(d) $\operatorname{cosec}\theta - \cot\theta$

**45.** What is $\dfrac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} - \dfrac{\sin\theta + 1}{\cos\theta}$ equal to?

(a) 0

(b) 1

(c) $2\sin\theta$

(d) $2\cos\theta$

**46.** The length and breadth of a rectangle are in the ratio $4 : 3$. Then what is the ratio of the area of the triangle formed by the parts of the diagonals with a long side to the area of the triangle formed by the parts of diagonals with a short side?

(a) $3 : 4$

(b) $4 : 3$

(c) $16 : 9$

(d) $1 : 1$

**47.** Suppose a region is formed by removing a sector of $20°$ from a circular region of radius 30 feet. What is the area of this new region?

(a) $150\pi$ square feet

(b) $550\pi$ square feet

(c) $650\pi$ square feet

(d) $850\pi$ square feet

48. $ABCD$ is a parallelogram where $AC$ and $BD$ are the diagonals. If $\angle BAD = 60°$, $\angle ADB = 90°$, then what is $BD^2$ equal to?

(a) $\dfrac{3}{5} AB^2$

(b) $\dfrac{3}{4} AB^2$

(c) $\dfrac{1}{2} AB^2$

(d) $\dfrac{2}{3} AB^2$

49. A line through the vertex $A$ of a parallelogram $ABCD$ meets $DC$ in $P$ and $BC$ produced in $Q$. If $P$ is the mid-point of $DC$, then which of the following is/are correct?

1. Area of $\triangle PDA$ is equal to that of $\triangle PCQ$

2. Area of $\triangle QAB$ is equal to twice that of $\triangle PCQ$

Select the correct answer using the code given below:

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

50. How many cubic metre of earth is to be dug out to dig a well of radius $1\cdot4$ m and depth $5$ m?

(a) $30\cdot2$ cubic metre

(b) $30\cdot4$ cubic metre

(c) $30\cdot6$ cubic metre

(d) $30\cdot8$ cubic metre

51. If the diagonals of a rhombus are $x$ and $y$, then what is its area?

(a) $\dfrac{xy}{2}$

(b) $\dfrac{xy}{4}$

(c) $xy$

(d) $x^2 - y^2$

52. The lengths of sides of a triangle are $3x, 4\sqrt{y}, 5\sqrt[3]{z}$, where $3x < 4\sqrt{y} < 5\sqrt[3]{z}$. If one of the angles is $90°$, then what are the minimum integral values of $x, y, z$ respectively?

(a) 1, 2, 3

(b) 2, 3, 4

(c) 1, 1, 1

(d) 3, 4, 5

53. What is the maximum number of circum-circles that a triangle can have?

(a) 1

(b) 2

(c) 3

(d) Infinite

54. If an arc of a circle of radius 6 cm subtends a central angle measuring $30°$, then which one of the following is an approximate length of the arc?

(a) $3\cdot14$ cm

(b) $2\cdot15$ cm

(c) $2\cdot14$ cm

(d) $2$ cm

17

55. A ladder 5 m long is placed in a room so as to reach a point 4·8 m high on a wall and on turning the ladder over to the opposite side of the wall without moving the base, it reaches a point 1·4 m high. What is the breadth of the room ?

(a) 5·8 m

(b) 6 m

(c) 6·2 m

(d) 7·5 m

56. What is the area of the largest square plate cut from a circular disk of radius one unit ?

(a) 4 square units

(b) $2\sqrt{2}$ square units

(c) $\pi$ square units

(d) 2 square units

57. Out of 4 identical balls of radius $r$, 3 balls are placed on a plane such that each ball touches the other two balls. The 4$^{th}$ ball is placed on them such that this ball touches all the three balls. What is the distance of centre of 4$^{th}$ ball from the plane ?

(a) $2\sqrt{\dfrac{2}{3}}\, r$ unit

(b) $\dfrac{\sqrt{3}+2\sqrt{2}}{\sqrt{2}}\, r$ unit

(c) $\dfrac{r}{3-2\sqrt{2}}$ unit

(d) $\dfrac{\sqrt{3}+2\sqrt{2}}{\sqrt{3}}\, r$ unit

58. A right circular cylinder just encloses a sphere. If $p$ is the surface area of the sphere and $q$ is the curved surface area of the cylinder, then which one of the following is correct ?

(a) $p = q$

(b) $p = 2q$

(c) $2p = q$

(d) $2p = 3q$

59. $ABCD$ is a quadrilateral such that $AD = DC = CA = 20$ units, $BC = 12$ units and $\angle ABC = 90°$. What is the approximate area of the quadrilateral $ABCD$ ?

(a) 269 sq units

(b) 300 sq units

(c) 325 sq units

(d) 349 sq units

60.
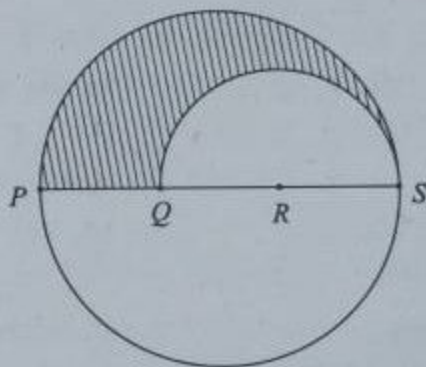


Let $PQRS$ be the diameter of a circle of radius 9 cm. The length $PQ$, $QR$ and $RS$ are equal. Semi-circle is drawn with $QS$ as diameter (as shown in the given figure). What is the ratio of the shaded region to that of the unshaded region ?

(a) $25 : 121$

(b) $5 : 13$

(c) $5 : 18$

(d) $1 : 2$

19

61. A number divides 12288, 28200 and 44333 so as to leave the same remainder in each case. What is that number ?

(a) 272

(b) 232

(c) 221

(d) 120

62. If $x^2 + 9y^2 = 6xy$, then what is $y : x$ equal to ?

(a) $1 : 3$

(b) $1 : 2$

(c) $2 : 1$

(d) $3 : 1$

63. If $m$ and $n$ are positive integers such that $m^n = 1331$, then what is the value of $(m-1)^{n-1}$ ?

(a) 1

(b) 100

(c) 121

(d) 125

64. What is $\dfrac{1}{a^{m-n}-1} + \dfrac{1}{a^{n-m}-1}$ equal to ?

(a) 1

(b) −1

(c) 0

(d) $2a^{m-n}$

65. If $x = \sqrt{2}$, $y = \sqrt[3]{3}$ and $z = \sqrt[6]{6}$, then which one of the following is correct ?

(a) $y < x < z$

(b) $z < x < y$

(c) $z < y < x$

(d) $x < y < z$

66. If $\log x = 1 \cdot 2500$ and $y = x^{\log x}$, then what is $\log y$ equal to ?

(a) $4 \cdot 2500$

(b) $2 \cdot 5625$

(c) $1 \cdot 5625$

(d) $1 \cdot 2500$

67. If $f(x)$ is divided by $(x-\alpha)(x-\beta)$ where $\alpha \neq \beta$, then what is the remainder ?

(a) $\dfrac{(x-\alpha)f(\alpha)-(x-\beta)f(\beta)}{\alpha-\beta}$

(b) $\dfrac{(x-\alpha)f(\beta)-(x-\beta)f(\alpha)}{\alpha-\beta}$

(c) $\dfrac{(x-\beta)f(\alpha)-(x-\alpha)f(\beta)}{\alpha-\beta}$

(d) $\dfrac{(x-\beta)f(\beta)-(x-\alpha)f(\alpha)}{\alpha-\beta}$

68. If the area of a square is $2401x^4 + 196x^2 + 4$, then what is its side length ?

(a) $49x^2 + 3x + 2$

(b) $49x^2 - 3x + 2$

(c) $49x^2 + 2$

(d) $59x^2 + 2$

21

**69.** If $x$ varies as $yz$, then $y$ varies inversely as

(a) $xz$

(b) $\frac{x}{z}$

(c) $\frac{z}{x}$

(d) $\frac{1}{(xz)}$

**70.** If the points $P$ and $Q$ represent real numbers $0.7\overline{3}$ and $0.5\overline{6}$ on the number line, then what is the distance between $P$ and $Q$?

(a) $\frac{1}{6}$

(b) $\frac{1}{5}$

(c) $\frac{16}{45}$

(d) $\frac{11}{90}$

**71.** What is the point on the $xy$-plane satisfying $5x + 2y = 7xy$ and
$$10x + 3y = 8xy ?$$

(a) $\left(-1, \frac{1}{6}\right)$

(b) $\left(\frac{1}{6}, -1\right)$

(c) $\left(1, \frac{1}{6}\right)$

(d) $\left(-\frac{1}{6}, -1\right)$

**72.** The price of an article $X$ increases by 20% every year and price of article $Y$ increases by 10% every year. In the year 2010, the price of article $X$ was ₹5000 and price of article $Y$ was ₹2000. In which year the difference in their prices exceeded ₹5000 for the first time ?

(a) 2012

(b) 2013

(c) 2014

(d) 2015

**73.** The ratio of speeds of $X$ and $Y$ is $5 : 6$. If $Y$ allows $X$ a start of $70\,m$ in a $1.2\,km$ race, then who will win the race and by what distance ?

(a) $X$ wins the race by $30\,m$

(b) $Y$ wins the race by $90\,m$

(c) $Y$ wins the race by $130\,m$

(d) The race finishes in a dead heat

**74.** A train takes two hours less for a journey of $300\,km$ if its speed is increased by $5\,km/hr$ from its usual speed. What is its usual speed ?
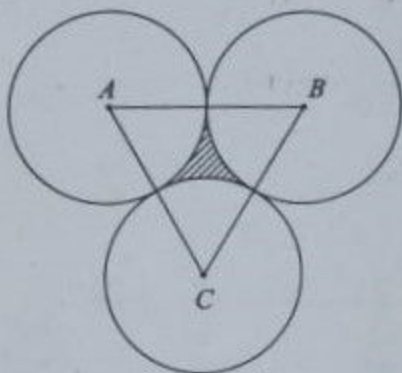
(a) $50\,km/hr$

(b) $40\,km/hr$

(c) $35\,km/hr$

(d) $25\,km/hr$

23

**75.** If 6 men and 8 women can do a piece of work in 10 days; and 13 men and 24 women can do the same work in 4 days, then what is the ratio of daily work done by a man to that of a woman ?
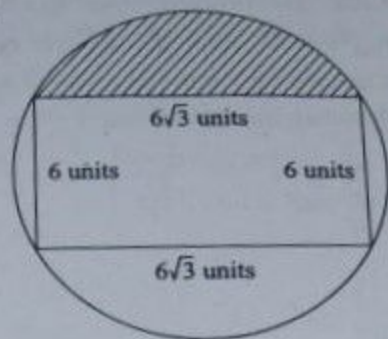
(a) $2:1$

(b) $1:2$

(c) $4:3$

(d) $3:4$

**76.**



What is the area of the shaded region in the given figure, if the radius of each of the circles is 2 cm ?

(a) $4\sqrt{3}-2\pi$ cm$^2$

(b) $\sqrt{3}-\pi$ cm$^2$

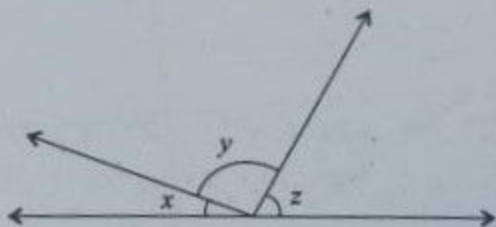(c) $\sqrt{3}-\dfrac{\pi}{2}$ cm$^2$

(d) $2\pi-2\sqrt{3}$ cm$^2$

**77.**



In the given figure, what is the area of the shaded region ?

(a) $9(\pi-\sqrt{3})$ sq units

(b) $3(4\pi-3\sqrt{3})$ sq units

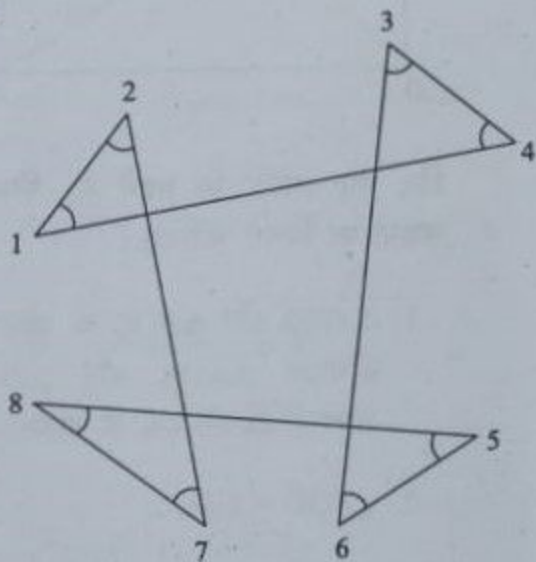(c) $3(3\pi-4\sqrt{3})$ sq units

(d) $9(\sqrt{3}-\pi)$ sq units

**78.**



In the given figure, if $\dfrac{y}{x}=6$ and $\dfrac{z}{x}=5$, then what is the value of $x$ ?

(a) $45°$

(b) $30°$

(c) $15°$

(d) $10°$

25

**79.** ABCD is a trapezium, where AB is parallel to DC. If $AB=4$ cm, $BC=3$ cm, $CD=7$ cm and $DA=2$ cm, then what is the area of the trapezium ?

(a) $22\sqrt{\dfrac{2}{3}}$ cm$^2$

(b) $22\sqrt{\dfrac{3}{2}}$ cm$^2$

(c) $22\sqrt{3}$ cm$^2$

(d) $\dfrac{22\sqrt{2}}{3}$ cm$^2$

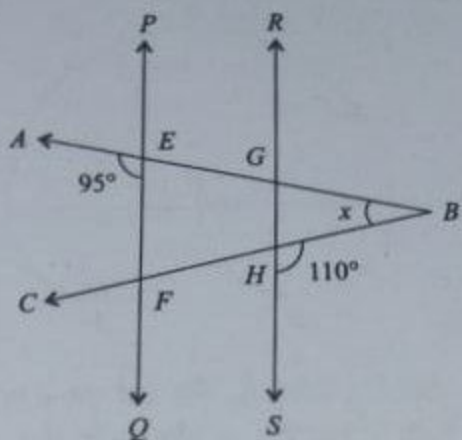**80.**



Angles are shown in the given figure. What is value of $\angle 1+\angle 2+\angle 3+\angle 4+\angle 5+\angle 6+\angle 7+\angle 8$ ?

(a) $240°$

(b) $360°$

(c) $540°$

(d) $720°$

**81.**
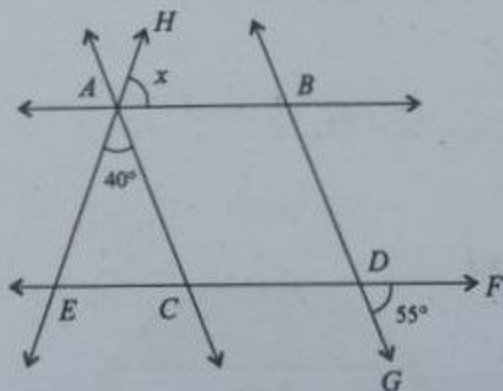


In the given figure $PQ$ is parallel to $RS$, $\angle AEF=95°$, $\angle BHS=110°$, and $\angle ABC=x°$. Then what is the value of $x$ ?

(a) 15

(b) 25

(c) 30

(d) 35

**82.**



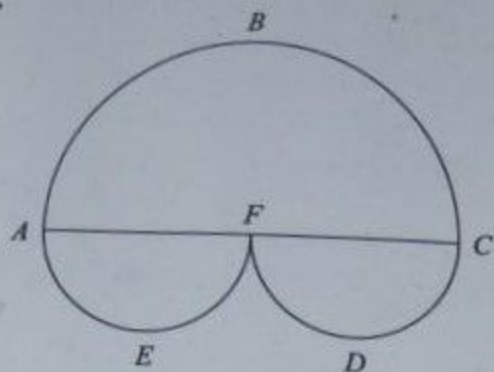In the given figure $AB$ is parallel to $CD$ and $AC$ is parallel to $BD$. If $\angle EAC=40°$, $\angle FDG=55°$, $\angle HAB=x°$, then what is the value of $x$ ?

(a) 85

(b) 80
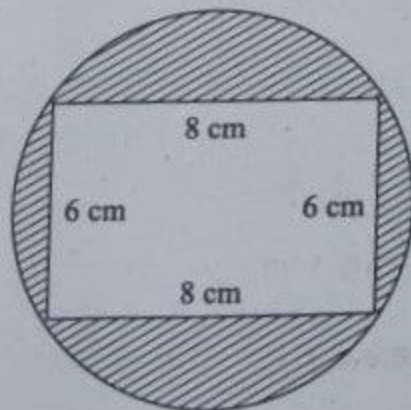
(c) 75

(d) 65

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**83.**



In the given figure, there are three semi circles $ABC$, $AEF$ and $CDF$. The distance between $A$ and $C$ is 28 units and $F$ is the mid-point of $AC$. What is the total area of the three semi circles ?

(a) 924 square units

(b) 824 square units

(c) 624 square units

(d) 462 square units

**84.**



What is the approximate area of the shaded region in the figure given ?

(a) 15·3 cm²

(b) 25·5 cm²

(c) 28·4 cm²

(d) 30·5 cm²

**85.**
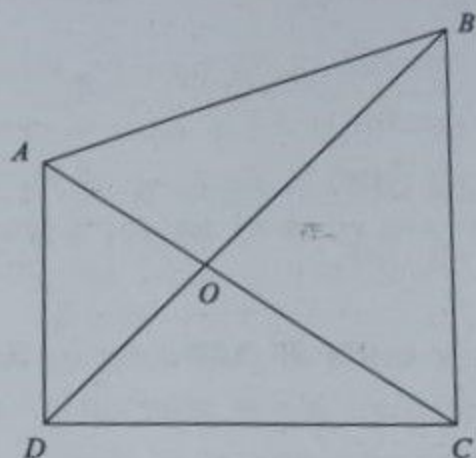


Consider the following statements with reference to the given figure :

1. The sum of the areas of $\triangle AOD$ and $\triangle BOC$ is equal to the sum of the areas of $\triangle AOB$ and $\triangle DOC$.

2. $\angle AOD = \angle BOC$

3. $AB + BC + CD + DA > AC + BD$

Which of the above statements are correct ?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

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86. Students of a class are made to sit in rows of equal number of chairs. If number of students is increased by 2 in each row, then the number of rows decreases by 3. If number of students is increased by 4 in each row, then the number of rows decreases by 5. What is the number of students in the class ?

(a) 100

(b) 105

(c) 110

(d) 120

87. A sum was put at simple interest at certain rate for 2 years. Had it been put at 1% higher rate of interest, it would have fetched ₹24 more. What is the sum ?

(a) ₹500

(b) ₹600

(c) ₹800

(d) ₹1200

88. The population of two villages is 1525 and 2600 respectively. If the ratio of male to female population in the first village is 27 : 34 and the ratio of male to female population in the second village is 6 : 7, then what is the ratio of male to female population of these two villages taken together ?

(a) $\dfrac{33}{41}$

(b) $\dfrac{85}{82}$

(c) $\dfrac{71}{90}$

(d) $\dfrac{5}{6}$

89. In a class room the ratio of number of girls to that of boys is 3 : 4. The average height of students in the class is 4·6 feet. If the average height of the boys in the class is 4·8 feet, then what is the average height of the girls in the class ?

(a) Less than 4·2 feet

(b) More than 4·2 feet but less than 4·3 feet

(c) More than 4·3 feet but less than 4·4 feet

(d) More than 4·4 feet but less than 4·5 feet

90. What is the median of the data 3, 5, 9, 4, 6, 11, 18 ?

(a) 6

(b) 6·5

(c) 7

(d) 7·5

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91. In a pi-diagram there are three sectors. If the ratio of the angles of the sectors is $1:2:3$, then what is the angle of the largest sector ?

(a) $200°$

(b) $180°$

(c) $150°$

(d) $120°$

92. The maximum marks in a Test are converted from 250 to 50 for the purpose of an Internal Assessment. The highest marks scored were 170 and lowest marks were 70. What is the difference between the maximum and minimum marks scored in the Internal Assessment ?

(a) 15

(b) 17

(c) 20

(d) 24

Directions for the following three (03) items :

Read the following information and answer the three items that follow :

The following data presents count of released convicts who have served prison terms $(X)$, those who have received some educational or technical training during their term $(Y)$ and those who were offered Company placement $(Z)$ respectively, from six different jails A, B, C, D, E and F, in the year 2010.

|  | X | Y | Z |
|---|---|---|---|
| A | 86 | 45 | 25 |
| B | 1305 | 903 | 461 |
| C | 2019 | 940 | 474 |
| D | 1166 | 869 | 416 |
| E | 954 | 544 | 254 |
| F | 1198 | 464 | 174 |

93. Jails with highest and smallest percentage of trained convicts are respectively

(a) F and D

(b) D and F

(c) C and A

(d) D and A

94. Jail with highest placement rate of trained convicts is

(a) F

(b) D

(c) B

(d) A

95. Jails from which more than half of the trained convicts are offered jobs, are

(a) A, B and C

(b) A, B and D

(c) A, D and E

(d) A, E and F

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96. The number of three digit numbers (all digits are different) which are divisible by 7 and also divisible by 7 on reversing the order of the digits, is

(a) Six

(b) Five

(c) Four

(d) Three

97. How many integral values of $x$ and $y$ satisfy the equation $5x + 9y = 7$, where $-500 < x < 500$ and $-500 < y < 500$ ?

(a) 110

(b) 111

(c) 112

(d) None of the above

98. Let $XYZ$ be a 3-digit number. Let $S = XYZ + YZX + ZXY$. Which of the following statements is/are correct ?

1. $S$ is always divisible by 3 and $(X + Y + Z)$

2. $S$ is always divisible by 9

3. $S$ is always divisible by 37

Select the correct answer using the code given below :

(a) 1 only

(b) 2 only

(c) 1 and 2

(d) 1 and 3

99. In covering certain distance, the average speeds of $X$ and $Y$ are in the ratio $4 : 5$. If $X$ takes 45 minutes more than $Y$ to reach the destination, then what is the time taken by $Y$ to reach the destination ?

(a) 135 minutes

(b) 150 minutes

(c) 180 minutes

(d) 225 minutes

100. For two observations, the sum is $S$ and product is $P$. What is the harmonic mean of these two observations ?

(a) $\dfrac{2S}{P}$

(b) $\dfrac{S}{(2P)}$

(c) $\dfrac{2P}{S}$

(d) $\dfrac{P}{(2S)}$

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