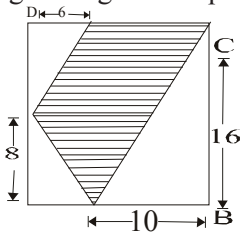
SPECIMEN QUESTIONS FOR

CLASS - 10

Class : 10

1. Find the area of the shaded region in the given figure of square ABCD ?



(a) 128cm² (b) 192cm² (c) 148cm² (d) 168cm²

2. $xSin^3\alpha + yCos^3\alpha = Sin\alpha Cos\alpha$ and $xSin\alpha - yCos\alpha = 0$ then which of the statement is true

(a) $x^2 + 2y^2 = 1$ (b) $x^2 - 2y^2 = 1$

(c) $x^2 + y^2 = 1$ (d) $x^2 - y^2 = 1$

3. $x + 1/x = \sqrt{3}$ Then $x^{30} + x^{24} + x^{18} + x^{12} + x^6 + 1 = ?$

(a) $6\sqrt{3}$ (b) $\sqrt[6]{3}$ (c) 1 (d) 0

4. Factorise $(x + 1)(x + 2) - \dfrac{p+1}{p^2}$

(a) $(x + p + 1)(x + \dfrac{1}{p} - 2)$

(b) $(x + 1 + \dfrac{1}{p})\ (x + p - ½)$

(c) $(x + 2 + \dfrac{1}{p})\ (x + 1 - \dfrac{1}{p})$

(d) $(x + p)\ (x - \dfrac{2}{p} + 1)$

5. If then $\dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}=\dfrac{1}{a+b+c}$

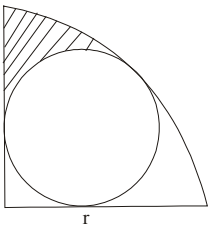
(a) $\dfrac{1}{a^5}+\dfrac{1}{b^5}+\dfrac{1}{c^5}=\dfrac{1}{a^5+b^5+c^5}$

(b) $\dfrac{1}{(a+b+c)^5}=\dfrac{1}{a^5}+\dfrac{1}{b^5}+\dfrac{1}{c^5}$

(c) $\dfrac{1}{a^5+b^5+c^5}=\dfrac{1}{(a+b+c)^5}$

(d) All of these.

6. In a quadrant (of a circle) a circle of maximum possible area is given. If the radius of the circumscribing quadrant be r, then what is the area of the inscribed circle.



(a) $\left(2+3\sqrt{2}\right)r^2$ (b) $\dfrac{\pi r^2}{\left(3+2\sqrt{2}\right)}$

(c) $\left(\dfrac{3+2\sqrt{2}}{r^2}\right)\pi$ (d) None of these.

7. If $a + b + c = 1$, $a^2 + b^2 + c^2 = 2$,
$a^3 + b^3 + c^3 = 3$ then find the value of $a^4 + b^4 + c^4$

(a) 21/6 (b) 23/6 (c) 25/6 (d) 27/6

8. From a helicopter which stays between two parts and parallel with horizontal road is at a height 'h' from ground. The angle of depression from the helicopter of two post is . then h = ?

(a) $\dfrac{Cot\alpha Cot\beta}{Cot\alpha + Cot\beta}$ (b) $\dfrac{\tan\alpha\tan\beta}{\tan\alpha+\tan\beta}$

(c) $\frac{Co\sec\alpha.Cos\sec\beta}{Co\sec\alpha+Cos\sec\beta}$ (d) $\frac{Sec\alpha Sec\beta}{Sec\alpha+Sec\beta}$

9. Simplify : – $\frac{1}{x-a}-\frac{1}{x+a}-\frac{2a}{x^2+a^2}-\frac{4a^3}{x^4+a^4}$

(a) $\frac{5a^5}{\left(x^4+a^4\right)^2}$ (b) $\frac{8a^7}{x^8-a^8}$

(c) $\frac{7a^7}{\left(x^4-a^4\right)^2}$ (d) $\frac{9a^7}{x^8+a^8}$

10. Δ AD, BE, CF are three medians of ABC, then

(a) $9BC^2 = 5CF^2 + 5BE^2 – 4AD^2$

(b) $9BC^2 = 8CF^2 + 8BE^2 – 4AD^2$

(c) $9BC^2 = 4CF^2 + 4BE^2 – 5AD2$

(d) $9BC^2 = 9CF^2 + 9BE^2 – 5AD^2$

11. A straight line intersects BC, CA and extended BA of ΔABC at points, L, M, N respectively. Three perpendiculars AP, BQ, CR are drawn on to the straight line LMN from A, B, C respectively. Then

(a) $\frac{BL}{CL}+\frac{CM}{AM}+\frac{AN}{BN}=3$ (b) $\frac{BL}{CL}\cdot\frac{CM}{AM}\cdot\frac{AN}{BN}=1$

(c) $\frac{BL+CM+AN}{CL+AM+BN}=\frac{2}{\sqrt{3}}$ (d) None of these.

12. If $\sqrt{a-x}+\sqrt{b-x}+\sqrt{c-x}=0$; then (a + b + c + 3x)(a + b + c – x) = ?

(a) $(ab + bc + ca)^4$ (b) $4(ab + bc + ca)$

(c) $(ab + bc + ca)^2$ (d) $2(ab + bc + ca)$

13. If $\sqrt{x^2+\sqrt[3]{x^4y^2}}+\sqrt{y^2+\sqrt[3]{x^2y^4}}$ = a then

(a) $x^{\frac{1}{3}}+y^{\frac{1}{3}}=a^{\frac{1}{3}}$ (b) $x^{-\frac{1}{3}}+y^{-\frac{1}{3}}=a^{-\frac{1}{3}}$

(c) $x^{\frac{2}{3}}+y^{\frac{2}{3}}=a^{\frac{2}{3}}$ (d) $x^{-\frac{2}{3}}+y^{-\frac{2}{3}}=a^{-\frac{2}{3}}$

14. Arjun carried some arrows for fighting with Bheeshm. With half the arrows, he cut down the arrows thrown by Bheeshm on him and with six other arrows he killed the rath driver. With one arrow each he knocked down respectively the rath, flag and the bow of Bheeshm. Finally, with one more than four times the square root of arrows he had he laid Bheeshm unconscious on an arrow bed. Find the total number of arrows Arjun had.

(a) 1000 (b) 10000 (c) 100 (d) 10

15. The formula expressing the relationship between x and y in the table is :

x	2	3	4	5	6
y	0	2	6	12	20

(a) $y = 2x – 4$ (b) $y = x^2 – 3x + 2$

(c) $y = x^3 – 3x^2 + 2x$ (d) $y = x^2 – 4x$

16. Construction of a cummulative frequency table is useful in determining the —

(a) mean (b) median

(c) mode (d) all the above three conditions

17. For a symmetrical distribution —

(a) Mean > Mode > Median

(b) Mean < Mode < Median

(c) Mean = Mode = Median

(d) Mode = $\frac{(Mean+Median)}{2}$

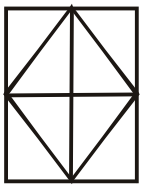
18. The A. M. of the following data :

x :	5	10	15	20	25
y ;	7	k	8	4	5

is 14. Then k =

(a) 5 (b) 6 (c) 7 (d) 8

19. Find the number of triangles in the given figure.



(a) 8 (b) 10 (c) 12 (d) 14

20. If $\frac{3+5+7+...+n\ terms}{5+8+11+...+10 terms}=7$, then the value of 'n' is

(a) 35 (b) 36 (c) 37 (d) 40

21. If the sum of the first 2n terms of the A.P. 2, 5, 8, ..., is equal to the sum of the first 'n' terms of the A.P., 57, 59, 61,...., then 'n' equals

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

22.. $x=\sqrt{4+\sqrt{4-\sqrt{4+\sqrt{4-.....\infty}}}}$ Find the value of 'x'

(a) 3 (b) $\left(\frac{\sqrt{13}-1}{2}\right)$ (c) $\left(\frac{\sqrt{13}+1}{2}\right)$ (d) $\sqrt{3}$

23. If for an A.P., $T_4 + T_8 = 24$ and $T_6 + T_{10} = 34$. Then first term =

(a) 1/2 (b) 3/2 (c) –1/2 (d) –3/2

24. If $x = (x - 3)$, then the given equation has .... solution/solutions.

(a) x = –4 (b) x = 4, 1/2 (both)

(c) x =1/2 (d) no solution

25. If $(a+b)t_1=(b+c)t_2=(c+d)t_3=(a+d)t$, then $\frac{1}{t}=?$

(a) $\frac{1}{t_1}+\frac{1}{t_2}+\frac{1}{t_3}$ (b) $\frac{1}{t_1}-\frac{1}{t_2}+\frac{1}{t_3}$

(c) $\frac{1}{t_2}-\frac{1}{t_3}-\frac{1}{t_1}$ (d) None of these

26. If $\frac{a}{3}=\frac{b}{4}=\frac{c}{7}$, what is the value of $\frac{a+b+c}{6}$?

(a) 2 (b) 3 (c) 5 (d) 9

27. In what time, will Rs. 800 amount to Rs. 1056 at 8% interest per annum ?

(a) 6 years (b) 7.5 years

(c) 3.5 years (d) 4 years

28. How many litres of a 3% hydrogen peroxide solution should be mixed with a 6 litres of 30% hydrogen peroxide solution so as to get a mixture of 12% solution?

(a) 3 litres (b) 6 litres (c) 9 litres (d) 12 litres

29. Gas is being pumped into a spherical balloon at the rate of 100 cm^3/min. When the radius is 10cm., the surface area is changed at the rate of

(a) 5 cm^2/min (b)10 cm^2/min

(c) 20 cm^2/min (d)15 cm^2/min

30. In the given figure D and E trisect BC. Chose the correct option.

(a) $8AE^2 = 5AD^2 + 3AB^2$

(b) $8AE^2 = 3AC^2 + 5AD^2$

(c) $8AE^2 = 3AB^2 + 5AD^2$

(d) None of these

31. Two cone having same height & radius r_1 & $r_2$cm respectively are melted to form a sphere of radius RCm. What will be the height of the cone.

(a) $\frac{3R^3}{r_1^2-r_2^2}$ (b) $\frac{3R^3}{r_1^2+r_2^2}$ (c) $\frac{4R^3}{r_1^2+r_2^2}$ (d) $\sqrt[R]{r_1 r_2}$

32. A Cone has ground surface radius r, height h & sem[illegible]ch of the statement is true.

(a) $Co\sec\alpha Sec\alpha = \frac{r}{h} + \frac{h}{r}$ (b) $Co\sec\alpha Cot\alpha = \frac{1}{r^2/h^2 + h^2/r^2}$

(c) $Sec\alpha \tan\alpha = \frac{r/h + h/r}{\sqrt{r^2/h^2 + h^2/r^2}}$ (d) $Sin\alpha Cos\alpha = \left(\frac{r}{h} + \frac{h}{r}\right)^{3/2}$

33. Which is the 'Hero's formula

(a) $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$ (b) ½ × base × height

(c) hypotenuse $= \sqrt{(perpendicular)^2 + (base)^2}$ (d) None of these.

34. A publisher have printed 12000 copy of a book expensing 70,400 rupees. 1000 copy of the book is given to various schools & academic organisation free of cost & rest are sold in rs.10 each. If the publisher decided to give a free copy for each 24 copies then calculate the percentage of profit?

(a) 40% (b) 20% (c) 15% (d) 5%

35. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$ then the value of $\left(\frac{a^n p + c^n q + e^n r}{b^n p + d^n q + f^n r}\right)^{1/n} = ?$

(a) $\frac{ad}{bc}$ (b) $\frac{af}{bc}$ (c) $\frac{ck}{dk}$ (d) None of these.

36. The value of m for which the given system of equations mx-$5y$ = 10 and $8x$+$9y$ = 24 has no solution.

(a) $m \neq \frac{40}{9} and\ m = \frac{10}{3}$ (b) $m = -\frac{40}{9} and\ m \neq \frac{10}{3}$

(c) $m = \frac{40}{9} and\ m = \frac{10}{3}$ (d) $m \neq \frac{40}{9} and\ m \neq \frac{10}{3}$

37. If m = $a\cos^3\theta + 3a\cos\theta\sin^2\theta$, n = $3\sin^3\theta + 3a\sin\theta\cos^2\theta$, then the value of $(m+n)^{2/3} + (m-n)^{2/3}$ is

(a) 0 (b) 1 (c) $2a$ (d) $2a^{2/3}$

38. If $\frac{a}{ax-1} + \frac{b}{bx-1} = a + b\left(x \neq \frac{1}{a}, \frac{1}{b}\right)$ find the value of 'x'

(a) $\frac{a+b}{ab}, \frac{2}{a+b}$ (b) $\frac{a+b}{2}, \frac{ab}{a+b}$

(c) $\frac{ab}{2a+b}, \frac{2ab}{a+b}$ (d) $\frac{a+b}{2ab}, \frac{2a}{a+b}$

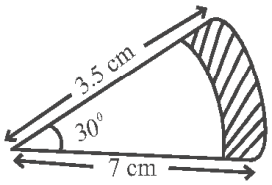
39. What is the sum of three digit natural numbers, which are divisible by 7 ?

(a) 70242 (b) 70639 (c) 70336 (d) 74129

40. The terminating decimal when expressed in fractional form always have denominators of the form.

(a) $2^m 3^n$ (b) $3^m 5^n$ (c) $5^n 7^m$ (d) $2^m 5^n$

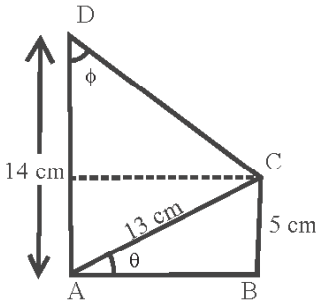
41. In the given figure, sector of two concentric circles of radi 7cm and 3.5 cm are shown. Find the area of the shaded region.



(a) 8.625 cm^2 (b) 9.1 cm^2 (c) 9.625 cm^2 (d) 7.625 cm^2

42. In the given figure, $\angle ABC = 90^0, \angle BAC = \theta, \angle ADC = \phi, BC = 5cm, AC = 13cm$ and . Find

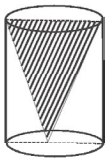
$AD = 14cm$ *Also* $\angle BAD = 90^0$ the values of $\cos ec\,\phi$ and $\tan\phi$



(a) $\frac{12}{13}, \frac{4}{3}$ (b) $\frac{5}{4}, \frac{4}{3}$ (c) $\frac{4}{3}, \frac{4}{5}$ (d) $\frac{4}{3}, \frac{7}{5}$

43. The median from the ogive curve can be determind by the point on :
(a) x - axis (b) Origin (c) y - axis (d) xy - plane

44. From a solid cylinder whose height is 12cm and diameter 10cm a conical cavity of same height and of same diametre is curved out. Find the total surface area of the remaining solid.



(a) 670 cm^2 (b) 770 cm^2 (c) 660 cm^2 (d) 780 cm^2

45. A girl of height 90 cm is walking away from the base of a lamp post at a speed of 1.2 m /s . If the lamp post is 3.6 m above the ground, find the length of her shadow after 4 secs.

(a) $1\cdot 2\,m$ (b) $1\cdot 6\,m$ (c) $1\cdot 9\,m$ (d) $2\cdot 2\,m$

46. If $\sum f_i x_i = 35, \sum f_i = 4p - 63$ and mean $= 7$ then p is equal to

(a) 12 (b) 13 (c) 14 (d) 17

47. If $\tan A = 1$ and $\tan B = \sqrt{3}$, then find $\cos A\cos B - \sin A\sin B$

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

48. If the angle subtended by two targents at an outer point is 60^0 and length of the chord formed by joining the point of contact of tangents is 12 cm, then the length of the tangent is given by;
(a) 4 cm (b) 18 cm (c) 12 cm (d) 6 cm

49. The sum of a two digit number and the number formed by interchanging the digit is 132. If 12 is added to the number, the new number becomes 5 times the sum of the digits . Find the number

(a) 46 (b) 48 (c) 45 (d) 43

50. Two circles touch externally at the point Q and PR is the common tangent to the circle, $\angle PQR$ is equal to :

(a) 60^0 (b) 45^0 (c) 90^0 (d) 30^0

51. If $x = t^{\frac{1}{t-1}}$ and $y = t^{\frac{1}{t-1}}$, $t > 0$, $t \neq 1$, then what is the relation between x and y?

(a) $y^x = x^{1/y}$ (b) $x^{1-y} = y^{1/x}$ (c) $x^y = y^x$ (d) $x^y = y^{1/x}$

52. The number of solutions of the equation $\sqrt{x^2-x+1}+\frac{1}{\sqrt{x^2-x+1}} = 2-x^2$ is

(a) 0 (b) 1 (c) 2 (d) 4

53. Let p and q be non-zero integers. Consider the polynomial $A(x) = x^2 + px + q$. It is given that $(x–m)$ and $(x-km)$ are simple factors of $A(x)$, where m is a non-zero integer and k is a positive integer, $k \geq 2$. Which one of the following is correct?

(a) $(k+1)^2 p^2 = kq$ (b) $(k+1)^2 q^2 = kp^2$ (c) $k^2q = (k+1)p^2$ (d) $k^2 p^2 = (k+1)^2 q$

54. Consider the following statements :

I. If $n \geq 3$ and $m \geq 3$ are distinct positive integers, then the sum of the exterior angles of a regular polygon of m sides is different from the sum of the exterior angles of a regular polygon of n sides.

II. If m and n are integers such that $m > n \geq 3$. Then, the sum of the interior angles of a regular polygon of m sides is greater than the sum of the interior angle of the regular polygon of n sides and their sum is $(m+n)\pi/2$.

Which of the above statements (s) is /are correct?

(a) Only I (b) Only II (c) Both I and II (d) Neither I or nor II

55. An equilateral ΔBOC is drawn inside a square $ABCD$. If $\angle AOD = 2\theta$, what is $\tan\theta$ equal to?

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

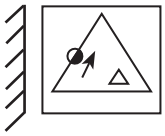
56. $ABCD$ is a cyclic quadrilateral of which AB is the diameter. Diagonals AC and BD intersect at E. If $\angle DBC = 35^\circ$, then $\angle AED$ measures

(a) 35° (b) 45° (c) 55° (d) 90°

57. If a circle of radius 12 cm is divided into two equal parts by one concentric circle, then radius of inner circle is

(a) 6cm (b) 4 cm (c) $6\sqrt{2}$ cm (d) $4\sqrt{2}$ cm

58. Direction : In the question you have figure with some pattern. Choose the alternative which closely resembles mirror image of the given one.



(a)  (b)  (c)  (d) 

59. A direction pole was situated on the crossing. Due to an accident the pole turned in such a manner that the pointer which was showing East, started showing South. One traveller went to the wrong direction thinking it to be West. In what direction actually he was travelling?

(a) North (b) South (c) East (d) West

60. $p < q$ then $p @ q = p \# q$, else $p @ q = q \# p$ where $a \# b = \frac{a}{b}$, then the value of (4 @ 5) @ (6@ 5).

(a) 24/25 (b) 2/3 (c) 3/4 (d) None of these.