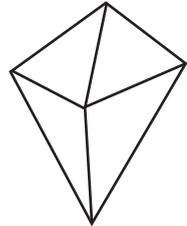


**CENTRE FOR PEDAGOGICAL STUDIES IN MATHEMATICS (CPSM)
ACHIEVEMENT-CUM-DIAGNOSTIC TEST IN MATHEMATICS-2023**

INSTRUCTION: Write your Name, Class Roll No. etc. in the answersheet. Select the correct answer out of (a), (b), (c) and (d) of particular item and fill the specific rectangle with blue/black ball pen denoting the correct answer. For example, if (c) is the correct answer to Q. No. X: blacken like this: Q. No. X: . Rough work is to be done on separate paper. Marks will be deducted for wrong answer. Don't waste time for answering a question which appears difficult to you, better try the next question.

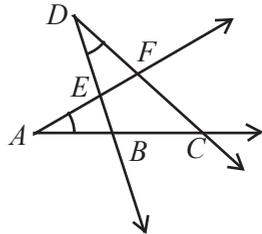
1. Count the number of line segments in the adjoining figure

- (a) 8
(b) 6
(c) 4
(d) 7



2. The number of common points in the two angles marked at A and D , is

- (a) 2
(b) 6
(c) 5
(d) 4

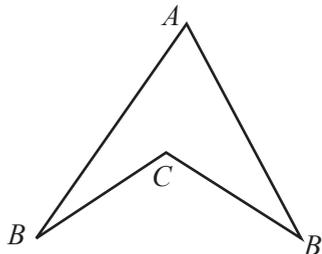


3. The maximum number of points of intersection of three straight lines drawn in a plane is

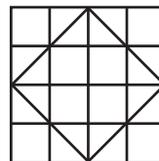
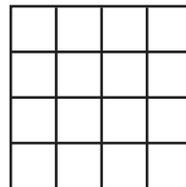
- (a) 1 (b) 2 (c) 3 (d) 6

4. In the adjoining quadrilateral $ABCD$, the number of diagonals is

- (a) 0 (b) 1
(c) 2 (d) None of these



5. A polygon has 5 sides, number of diagonals of the polygon is
 (a) 5 (b) 4 (c) 10 (d) 6
6. Number of squares in the adjoining figure is
 (a) 32 (b) 14
 (c) 29 (d) 30
7. If the lengths of two sides of an isosceles triangle are 3 cm, and 7 cm, then what is the length of the third side.
 (a) 7 cm (b) 3 cm (c) 5 cm (d) None of these
8. The number of triangles in the adjoining figure is
 (a) 20 (b) 22
 (c) 23 (d) 24
9. How many triangles can be drawn using any three dots given in the adjoining figure.
 (a) 5 (b) 4 (c) 3 (d) 6
10. The measure of an angle is 73° , the measure of its vertically opposite angle is
 (a) 17° (b) 107° (c) 27° (d) 73°
11. The angle between the number line l and the line segment joining a point and its image (reflection) is
 (a) 0° (b) 90° (c) 45° (d) 180°
12. The instrument in your Geometry Box having the shape of a semicircle is
 (a) divider (b) compass (c) protractor (d) ruler



21. The value of the expression $\frac{5x^2}{3} - 1$, when $x = -2$ is
 (a) $5\frac{2}{3}$ (b) 5 (c) 17 (d) $\frac{7}{3}$
22. Archana's present age is x years and her father's age is 3 years less than 4-times her age. Her father's present age is
 (a) $(3x - 4)$ yrs (b) $(4x + 3)$ yrs
 (c) $(4x - 3)$ yrs (d) $12x$ yrs
23. If $p = 4$, $q = 3$ and $r = 2$ then $\frac{p^2 + q^2 + r^2}{pq + qr - rp} =$
 (a) $\frac{29}{3}$ (b) $\frac{9}{13}$ (c) $\frac{9}{5}$ (d) $\frac{29}{10}$
24. Solve for x : $3(2x - 1) = 5 - (3x - 2)$
 (a) $\frac{9}{10}$ (b) $\frac{10}{9}$ (c) 1 (d) 0
25. The degree of the polynomial $3 - 2x + 7x^3 + \frac{2}{x}$ is
 (a) 2 (b) 1 (c) 4 (d) 3
26. The numerical co-efficient of t^2 in the algebraic expression $5 - 2t - 3t^2$ is
 (a) 3 (b) -3 (c) 5 (d) -2
27. Find the sum of the algebraic expressions $5x^3 - 3x + 7$, $2x^2 - 11$ and $7x^3 - 11x^2 + 4x - 3$
 (a) $12x^3 - 9x^2 + 7x - 7$ (b) $12x^3 - 13x^2 + 7x + 21$
 (c) $12x^3 + 9x^2 + x + 7$ (d) $12x^3 - 9x^2 + x - 7$
28. Subtract $p - 2q + r$ from the sum of $10p - r$ and $5p + 2q$.
 (a) $10p - r$ (b) $14p + 4q - 2r$
 (c) $16p - 2r$ (d) $14p + 2q - 2r$

29. The degree of the polynomial $3x^3y - 5xy^4 - 2x + 1$ is
 (a) 3 (b) 4 (c) 5 (d) 2
30. If $a = 3$ and $b = -1$ then the value of $(ab)^a$ is
 (a) -27 (b) 27 (c) -9 (d) 9
31. The co-efficient of $5c$ in $-5a^2bc$ is
 (a) a^2b (b) -5 (c) $-a^3b$ (d) $-5a^2b$
32. Simplify : $\frac{3x}{5} + \frac{2x}{3} - \left(\frac{x}{2} + \frac{2x}{5}\right)$
 (a) $\frac{x}{10}$ (b) $\frac{13x}{6}$ (c) $\frac{x}{30}$ (d) $\frac{11x}{30}$
33. $x - [x - \{x - (x - 1)\}] =$
 (a) $2x$ (b) $2x - 1$ (c) 1 (d) $x + 1$
34. When $a = 3$, $b = 0$ and $c = -2$ the value of $a^3 + b^3 + c^3 - 3abc$ is
 (a) 19 (b) 35 (c) 37 (d) 17
35. When $x = -1$, the value of the polynomial $3x^2 - 5x + 2$ is
 (a) 0 (b) -6 (c) 10 (d) -8
36. If metres of cloth costs Rs. y , then the cost of z metres of cloth is
 (a) Rs. $\frac{yz}{x}$ (b) Rs. xyz (c) Rs. $\frac{zx}{y}$ (d) Rs. $\frac{x}{yz}$
37. The simplest value of $a(b - c) + b(c - a) + c(a - b)$ is
 (a) 1 (b) 0 (c) abc (d) $a + b + c$
38. If $a = -1$, $b = -2$, then the value of $2(a^2 + ab) - ab + 3$
 (a) 5 (b) -1 (c) 3 (d) 7

39. The numerical co-efficient of x in $\frac{-x}{2}$ is
- (a) $\frac{1}{2}$ (b) 1
(c) $-\frac{1}{2}$ (d) none of these
40. The number of edges of a prism whose base is a polygon having x sides is
- (a) $3x$ (b) $6x$ (c) $2x$ (d) $x + 6$
41. Convert the speed 1.5 m/sec in to km/hr.
- (a) 5.4 km/hr (b) 54 km/hr (c) 18 km/hr (d) 27 km/hr
42. The product of a rational number and its reciprocal is
- (a) 0 (b) 1 (c) -1 (d) 2
43. Mr. Mallik deposited Rs. 25600 in his account. Two days later he with draws $\frac{2}{5}$ th of the amount and $\frac{3}{4}$ of the remaining amount on the next day. Find the amount left in his account.
- (a) Rs. 2452 (b) Rs. 11520 (c) Rs. 3840 (d) none of these
44. If 2.5 litres of milk cost Rs. 42.50, how much milk will cost Rs. 595?
- (a) 25 litres (b) 30 litres (c) 45 litres (d) 35 litres
45. Gaganbabu walks around a rectangular park whose length and breadth are 110 m and 70 m respectively at the rate of 4 km/hour. In how much time will he complete five rounds.
- (a) 27 mins (b) 30 mins (c) 54 mins (d) $13\frac{1}{2}$ mins
46. If the perimeter of a regular hexagon is 21 cm, find the length of each side of the hexagon.
- (a) 7 cm (b) 2.1 cm (c) 3.5 cm (d) 4.25 cm

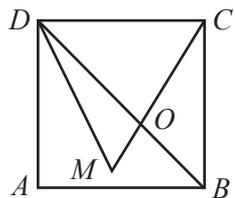
47. A wire is in the form of an equilateral triangle of side 24 cm is bent into the shape of a rectangle whose length is twice its breadth. Find the dimensions of the rectangle.
- (a) length = 12 cm, breadth = 6 cm
 (b) length = 24 cm, breadth = 12 cm
 (c) length = 16 cm, breadth = 8 cm
 (d) length = 48 cm, breadth = 24 cm
48. A square and a rectangle have equal area. If one side of the square is 24 cm and the length of the rectangle is 32 cm then the perimeter of the rectangle is
- (a) 124 cm (b) 96 cm (c) 50 cm (d) 100 cm
49. The area of a rectangle is 180 cm^2 and its length is 15 cm. The ratio of its breadth to its length is
- (a) 5 : 4 (b) 4 : 5 (c) 8 : 15 (d) 2 : 5
50. By selling an article for Rs. 4550, Bablu incurs a loss of 9%. What percent should he gain or lose by selling it for Rs. 4825?
- (a) $3\frac{1}{2}$ % loss (b) $3\frac{1}{2}$ % gain
 (c) 7% gain (d) 7% loss
51. $2.3 - \left[1.89 - \left\{ 3.6 - (2.7 - \overline{0.8 - 0.03}) \right\} \right] =$
- (a) 2 (b) 2.08 (c) 1 (d) none of these
52. In an orchard $\frac{1}{5}$ are orange trees, $\frac{3}{13}$ are mango trees and the rest are banana trees. If the banana trees are 148 in number, find the total number of trees in the orchard.
- (a) 650 (b) 360 (c) 520 (d) 260

53. A five digit number AB235 is divisible by 3 and $A + B < 5$, where A and B are single digits then the possible values of A and B are
- (a) $A = 1, B = 1$ or $A = 4, B = 0$
(b) $A = 1, B = 1$ or $A = 2, B = 0$
(c) $A = 1, B = 1$ or $A = 0, B = 2$
(d) $A = 2, B = 0$ or $A = 0, B = 2$
54. The length of three consecutive sides of an isosceles trapezium are 5 cm, 6 cm, and 8 cm, the length of the fourth side is
- (a) 5 cm (b) 6 cm (c) 8 cm (d) none of these
55. The sum of three consecutive even numbers is 84. The smallest number is
- (a) 26 (b) 28 (c) 30 (d) 24
56. How many five digit numbers of the form $AABAA$ is divisible by 33? (given A, B are digits)
- (a) 0 (b) 1 (c) 3 (d) infinite
57. If $P + 1 = Q, Q + 1 = R, P + Q = 15$ and $Q + R = 17$ then $P =$
- (a) 9 (b) 8 (c) 7 (d) 6
58. The greatest prime number by which 1144 and 1287 are divisible?
- (a) 143 (b) 11 (c) 13 (d) 17
59. Rs. 600 was divided among Jadu, Madu and Sidhu so that Jadu may get twice as much as Madhu and Madhu gets thrice as much as Sidhu. What is Sidhu's share?
- (a) Rs. 180 (b) Rs. 30 (c) Rs. 120 (d) Rs. 60

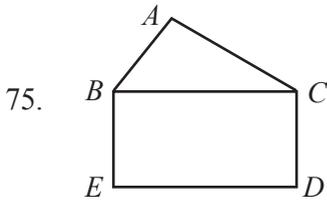
60. Bikas babu spends in 4 months as much as he earns in 3 months. If his yearly savings is Rs. 10500, find his monthly income.
- (a) Rs. 2625 (b) Rs. 3500 (c) Rs. 3000 (d) Rs. 7000
61. $8^2 - 5^2 - \{3 \times 2(4^2 - 3^2) - 7 \times 4\} =$
- (a) 5 (b) 15 (c) 35 (d) 25
62. In an examination Purba answered 5 questions out of 6 questions. She has, therefore answered $x\%$ of the questions. The value of x is
- (a) 83 (b) $83\frac{1}{3}$ (c) 84 (d) $93\frac{1}{3}$
63. Tutun covers half of his journey at 6 km/hr and the remaining half at 3 km/hr. His average speed is
- (a) 3 km/hr (b) 4 km/hr (c) $4\frac{1}{2}$ km/hr (d) 2 km/hr
64. The average of marks of mathematics of 5 students was found to be 50; later on, it was found that in case of one student, the marks 48 was misread as 84. The correct average is
- (a) 42.8 (b) 48.2 (c) 42 (d) 40.8
65. Sum of two numbers is 18 and their difference is 12, the product of the numbers is
- (a) 72 (b) 60 (c) 45 (d) 24
66. By selling a chair for Rs. 572, Ali gains 30%. The cost price of the chair is
- (a) Rs. 400 (b) Rs. 420 (c) Rs. 340 (d) Rs. 440
67. An accurate clock shows 8 O'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 O'clock in the afternoon.
- (a) 144° (b) 150° (c) 168° (d) 180°

68. The average of a number, its 75% and its 25% is 240, the number is
 (a) 400 (b) 320 (c) 360 (d) 300
69. When a number n is divided by 4 the remainder is 3. What will be the remainder when $2n$ is divided by 4?
 (a) 2 (b) 3 (c) 1 (d) 0
70. The sum of two numbers is 528 and their HCF is 33. The number of such pair is
 (a) 2 (b) 3 (c) 4 (d) 5
71. The degree of the polynomial $5x - 8x^2 + \frac{3}{x}x^3 - 6x^4$ is
 (a) 3 (b) 4 (c) 1 (d) 2
72. The minimum number of acute angles of a trapezium is
 (a) 3 (b) 2 (c) 1 (d) none of these
73. The three angles of a triangle are x° , $(x + 11)^\circ$ and $(x + 2)^\circ$. Find x
 (a) 69 (b) 61 (c) 60 (d) 59

74. In the adjoining figure $ABCD$ is a square, CDM is an equilateral triangle, CM intersects BD at O ; find the measure of the $\angle BOC$.



- (a) 75°
 (b) 115°
 (c) 95°
 (d) 105°



In the above figure $AB = \frac{5}{2}$ cm, $AC = 3\frac{3}{4}$ cm, $BC = 2\frac{3}{4}$ cm and $CD = \frac{7}{4}$ cm, Of the figures $\triangle ABC$ and $\square BCDE$, whose perimeter is greater and by how much?

- (a) Perimeter of $\square BCDE$ is greater than that of the $\triangle ABC$ by 1 cm.
- (b) Perimeter of $\square BCDE$ is greater than that of the $\triangle ABC$ by 3 cm.
- (c) The perimeter of the $\square BCDE$ is greater than that of the $\triangle ABC$ by $\frac{3}{2}$ cm.
- (d) The perimeter of both the figures are equal.
76. By how much does 1 exceed $2x - 3y - 4$?
- (a) $5 - 2x + 3y$ (b) $5 + 2x - 3y$
- (c) $3 - 2x + 3y$ (d) none of these
77. In a bag there are 20 kg of fruits, $7\frac{1}{6}$ kg of these fruits are oranges and $8\frac{2}{3}$ kg of these fruits are apples and the rest are grapes. Find the mass of the grapes in the bag.
- (a) 4 kg (b) $3\frac{1}{6}$ kg (c) $4\frac{1}{6}$ kg (d) $4\frac{5}{6}$ kg

78. Simplify $\frac{2^8 + a^5}{4^3 + a^2}$ and write the answer in exponential form.

- (a) $32a$ (b) 2^5a^3 (c) $4a^3$ (d) $2^2 \times a^3$

79. How many months in a year have 30 days?

- (a) 5 (b) 4 (c) 3 (d) 6

80. 25% of Rs. 25 is equal to

- (a) Rs. 6.25 (b) Rs. 0.625 (c) Rs. 25 (d) Rs. 1
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