

INSTITUTE OF MATHEMATICS EDUCATION

MATHS APTITUDE TEST – 2020 (Primary Level)

Std. : VII and VIII

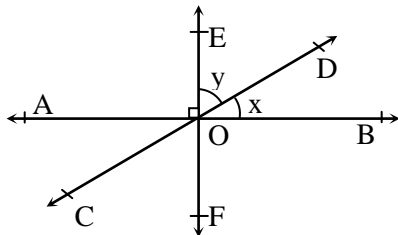
Question Paper

Date : 21.11.2020

Time : 2 Hours

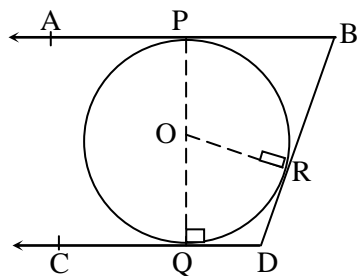
Total Marks : 100

- Find L.C.M. of $\frac{5}{7}, \frac{11}{13}, \frac{1}{17}, \frac{2}{19}$
(A) 110 (B) $\frac{1}{110}$ (C) $\frac{1}{29393}$ (D) $\frac{110}{29393}$
- Find $8^{3.5} : 2^{8.5}$
(A) 1 : 4 (B) 4 : 1 (C) 8 : 3 (D) 3 : 8
- $\sqrt{51}\%$ of $\sqrt{51} = ?$
(A) 5.1 (B) 51 (C) 0.51 (D) 0.051
- The ratio of SP : CP is 3 : 4. Find loss or profit %.
(A) 25% profit (B) 20% loss (C) 25% loss (D) 20% profit
- If principal and simple interest become equal after m years, then what is the rate of interest?
(A) $\frac{100}{m}$ pcpa (B) $\frac{10}{m}$ pcpa (C) 10 m pcpa (D) 100m pcpa
- Find the average of first 71 odd numbers.
(A) 72 (B) 70 (C) 75 (D) 71
- A train 350 m long crosses a pole in 21 sec. Find its speed.
(A) 60 km/hr (B) 80 km/hr (C) 40 km/hr (D) 45 km/hr
- Simplify $\sqrt{\frac{80}{125}} + \sqrt{26\frac{26}{25}}$
(A) 5 (B) 4 (C) 6 (D) 26
- Reciprocal of $\left(\frac{3}{7}\right)^{-5}$ is
(A) $\left(\frac{7}{3}\right)^{-5}$ (B) $\left(\frac{3}{7}\right)^5$ (C) Both (A), (B) (D) Neither (A) nor (B)
- Observe the given figure. If $x = 2y$, find $m\angle AOD$.



- (A) 150° (B) 90° (C) 120° (D) 100°
- If one man and two women complete certain work in 5 days and 2 men and 1 woman can do the same work in 4 days, then in how many days will 1 man and 1 woman complete the same work?
(A) $6\frac{1}{2}$ day (B) $6\frac{1}{3}$ days (C) $6\frac{2}{3}$ days (D) 4 days

12. If sum of all interior angles of a regular polygon is 1260° , then find the measure of its each exterior angle.
 (A) 50° (B) 40° (C) 60° (D) 90°
13. Karan had $(6x^2 + 5x + 2)$ with him. His father gave $(7x - x^2 - 11)$ to him. From the money he had, he purchased drawing material worth $(4x^2 + x - 12)$. Then how much amount is left with him?
 (A) $(x^2 + 11x + 3)$ (B) $(9x^2 - 11x + 3)$ (C) $(x^2 - 11x - 21)$ (D) $(x^2 - 11x - 3)$
14. If lengths of two sides of a triangle are 7.2 cm and 4.5 cm, then what can be the length of third side of the triangle?
 (A) 12 cm (B) 2.5 cm (C) 10 cm (D) cannot say
15. Which of the following is not a Pythagorean triplet?
 (A) 40, 42, 58 (B) $(a^2 - b^2), 2ab, (a^2 + b^2)$
 (C) 25, 60, 65 (D) 11, 40, 41
16. If $A = 3x^2 + 2x + 15$, $B = 4x^2 + 6x + 8$ and $C = x^2 - 7x + 11$, then find the value of $3A + \frac{1}{2}B - 4C$
 (A) $15x^2 + 25x + 25$ (B) $7x^2 + 37x + 5$ (C) $7x^2 + 19x - 25$ (D) Any other
17. If $\frac{a^5 - a^3}{a(a+1)(a-1)} = 16$, then find a.
 (A) ± 3 (B) 17 (C) 15 (D) ± 4
18. The sum of areas of two equilateral triangles is $25\sqrt{3}$ sq.cm. Their sides are in the ratio 3 : 4. Find the sum of their perimeter.
 (A) 21 cm (B) 42 cm (C) $42\sqrt{3}$ cm (D) 14 cm
19. Tangents AB and CD are parallel to each other and tangent BD touches the circle at R. If $PB = 9$ cm and $QD = 4$ cm, find the radius of the circle.

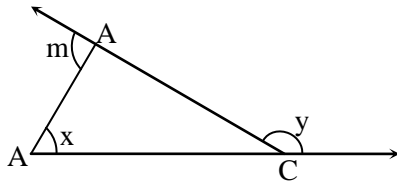


- (A) 12 cm (B) 6 cm (C) 13 cm (D) 10 cm
20. If $x^2 + \frac{1}{x^2} = 11$, then find $x^3 - \frac{1}{x^3}$, where $x > 1$
 (A) 18 (B) 36 (C) 27 (D) 9
21. $\left(1 - \frac{2}{n}\right) + \left(1 - \frac{4}{n}\right) + \left(1 - \frac{6}{n}\right) + \left(1 - \frac{8}{n}\right) + \dots$ n terms =
 (A) n (B) 2n (C) 1 (D) -1
22. The volume of a cylindrical container is 1500 ml. What is the volume of a conical container have same height and same base radius as that of cylinder.
 (A) 300 ml (B) 500 ml (C) 100 ml (D) 150 ml

23. Simplify : $\frac{5^{2020} + 5^{2019}}{5^{2019} - 5^{2018}}$

- (A) 7.5 (B) 25 (C) 2.5 (D) 1.25

24. In $\triangle ABC$, find the value of 'm'.



- (A) $180 - x + y$ (B) $180 - x - y$ (C) $180 + x - y$ (D) $x + y$

25. If $1.5x = 0.04y$, then find $\frac{y+x}{y-x}$.

- (A) $\frac{77}{73}$ (B) $\frac{73}{77}$ (C) $\frac{150}{4}$ (D) $\frac{15}{4}$

26. Find the smallest three digit number which when divided by 5, 7 and 10 leaves remainder 2 and is completely divisible by 9.

- (A) 352 (B) 702 (C) 720 (D) 632

27. Let $\frac{2a^2 - 3b^2}{2a^2 + 3b^2} = \frac{5}{59}$. Find a : b. (a, b > 0)

- (A) 3 : 4 (B) 4 : 3 (C) 4 : 5 (D) 5 : 4

28. If $0.09 = 20\%$ of $25\% x$, then find x.

- (A) 2 (B) 5 (C) 8 (D) 10

29. Marked price of an article is 'x'. The owner gives 10% discount and earns 20% profit, then what is the cost price?

- (A) $\frac{9x}{10}$ (B) $\frac{9x}{8}$ (C) $\frac{3x}{4}$ (D) $\frac{4x}{3}$

30. If difference between simple interest and compound interest after 2 years on ` 5000 is ` 72, find the rate of interest.

- (A) 12 pcpa (B) 8 pcpa (C) 10 pcpa (D) 15 pcpa

31. Average age of husband and wife was 23 years at the time of their marriage. After 2 years they had their first child. After 5 years of their marriage, today their second child is 1 year old. What is the average of the present ages of the family?

- (A) 20 years (B) 15 years (C) 24 years (D) 12 years

32. A man takes 5 hours 45 min in walking to certain place and riding back. He would have gained 2 hours by riding both the ways. Find the time he would take to walk both ways.

- (A) 3 hours 45 min. (B) 7 hours 45 min. (C) 9 hours 45 min (D) 7 hours 30 min

33. If $\sqrt{2} = 1.414$, $\sqrt{5} = 2.236$, then find $\sqrt{500} + \sqrt{28800}$.

- (A) 192.04 (B) 19.204 (C) 1920.4 (D) 1.9204

34. If $\sqrt[3]{10} = 2.155$, find the value of

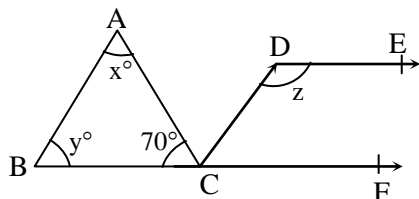
$$\sqrt[3]{5\frac{15}{125}} + \sqrt[3]{2\frac{20}{125}}$$

- (A) 0.3017 (B) 3.017 (C) 30.17 (D) 0.003017

35. Simplify $\frac{\sqrt{56} - \sqrt{28}}{\sqrt{126} - \sqrt{63}} =$

- (A) $0.\bar{6}$ (B) $0.\bar{3}$ (C) $0.\bar{45}$ (D) $\sqrt{7}$

36. In the given figure, $AB \parallel DC$, $DE \parallel BF$, $\angle ACB = 70^\circ$, then find value of z .



- (A) $x + 70$ (B) $y + 70$ (C) $x + 110$ (D) $110 - y$

37. A tap can fill a tank in 6 hrs. After half the tank is filled, three more similar taps are opened, then find the time required to fill the remaining tank.

- (A) 45 min (B) 30 min (C) 1 hour 15 min (D) 1 hour

38. The ratio of exterior angles of three regular polygons is $5 : 4 : 3$. Also measure of the highest exterior angle is 30° . Find the sum of all interior angles of a polygon having the greatest number of sides.

- (A) 2340° (B) 1800° (C) 3240° (D) 3600°

39. Simplify : $\frac{5a^5 - 10a^4b + 5a^3b^2}{(a - b)^2} \times \frac{(a^2 - b^2)}{5a^2(a + b)} =$

- (A) $a + b$ (B) $5(a - b)$ (C) $a(a - b)$ (D) $a(a + b)$

40. If the ratio of angles of a triangle is $5 : 6 : 7$, then find the ratio of their corresponding exterior angles

- (A) $5 : 6 : 7$ (B) $13 : 12 : 11$ (C) $7 : 6 : 5$ (D) $10 : 9 : 7$

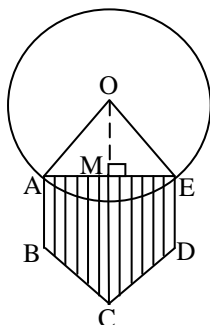
41. If the ratio of principals invested is $4 : 5$ and that of simple interest received is $2 : 3$, then find the ratio of periods if the rate of interest is same.

- (A) $5 : 4$ (B) $3 : 2$ (C) $5 : 6$ (D) $3 : 4$

42. If $a + b = 3$ and $ab = 2$, then find $a^3 + b^3$.

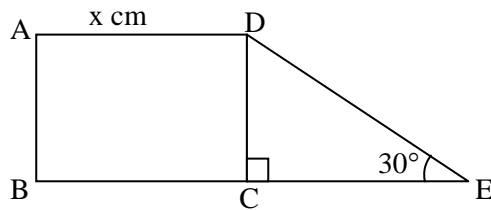
- (A) 27 (B) 35 (C) 9 (D) 12

43. OABCDE is a regular hexagon. If radius of the circle is 10 cm, then find the area of the shaded portion.



- (A) $150\sqrt{3}$ sq.cm (B) $25\sqrt{3}$ sq.cm (C) $125\sqrt{3}$ sq.cm (D) $50\sqrt{3}$ sq.cm

44. $\square ABCD$ is a square with side x cm. If $\angle DEC = 30^\circ$, find area of the figure ABCED.



- (A) $\frac{1}{2}x^2(2+\sqrt{3})$ (B) $\frac{1}{2}x^2(3+\sqrt{2})$ (C) $\frac{1}{2}x(2+\sqrt{3})$ (D) $\frac{1}{2}x(\sqrt{2}+3)$
45. A sphere and a cube have the same surface area. Find the ratio of volume of the sphere to that of the cube.
 (A) $6:4$ (B) $6:\pi$ (C) $\sqrt{6}:\sqrt{\pi}$ (D) $\sqrt{\pi}:6$
46. If $\frac{1+x+x^2}{1-x+x^2} = \frac{13(1+x)}{14(1-x)}$, where $x \neq 1$, then $x =$
 (A) 3 (B) $\frac{1}{3}$ (C) -1 (D) 0
47. Find the value of $(\sqrt{20-2\sqrt{91}})(\sqrt{13}+\sqrt{7})$
 (A) $2\sqrt{13}$ (B) $-2\sqrt{13}$ (C) $-\sqrt{91}$ (D) 6
48. The length and breadth of a rectangular card board paper are 'a' and 'b' respectively. Find the difference between volumes of hollow cylinders which are formed using this paper in two ways that is lengthwise and breadthwise.
 (A) $\frac{ab}{4\pi}(a+b)$ (B) $\frac{ab}{4\pi}(a-b)$ (C) $\frac{4ab}{\pi}(a-b)$ (D) $\frac{ab}{2\pi}(b-a)$
49. Which of the following is the smallest number?
 (A) 2^{150} (B) 7^{50} (C) 3^{100} (D) 5^{75}
50. Which of the following is a factor of $7^{19} - 7^{16}$?
 (A) 15 (B) 19 (C) 12 (D) 13

