MATHS

BOOKS - ARIHANT PUBLICATION JHARKHAND

SOLVED PAPER 2019

Section I Mathematics

1. If a,b,c are in AP and $\frac{a+b}{2}=x, \frac{b+c}{2}=y$, then the value of $(x+y)$ is .

A. 2a

B. 2b

C. $2(a+b)$

D. $2(b+c)$

Answer: B

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2. Four coins are tossed. The chance of getting none of the face as head is

A. $\frac{1}{16}$

B. $\frac{1}{8}$

C. $\frac{1}{6}$

D. $\frac{3}{4}$

Answer: A

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3. $n^2 - 1$ is divisible by 8, if n is

A. a natural number

B. an integer

C. an even Integer

D. an odd Integer

Answer: D

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4. A cube of side 4 cm cut into small cubes of each side 1 cm. The ratio of the surface area of all smaller cubes to that of large one is

A. $1:2$

B. $1:4$

C. $4:1$

D. $2:1$

Answer: C

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5. A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread

out to form a platform 22 m by 14 m. Find the height of the platform.

A. 2.5 m

B. 3.5 m

C. 5 m

D. 7 m

Answer: A

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6. Find the median of the following observations: 46, 64, 87, 41, 58, 77, 35, 90, 55, 92, 33. If 92 is replaced by 99 and 41 by 43 in the above data, find the new median?

A. 55

B. 58

C. 64

D. 43

Answer: B

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7. If a line $3x - ky = 5$ passes through $(3, 2)$, then the value of 'K is

A. 4

B. 3

C. 2

D. 1

Answer: C

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8. The rationalizing factor of $n\sqrt{\frac{a}{b}}$ is

A. $\sqrt[n]{\frac{a}{b}}$

B. $\sqrt{\frac{a}{b}}$

C. $\sqrt[n]{\frac{a^{n+1}}{b^{n+1}}}$

D. $\sqrt[n]{\frac{a^{n-1}}{b^{n-1}}}$

Answer: D

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9. Match the following .

Solids		Volume
1. Cone	a.	$\frac{4}{3}\pi r^3$
2. Cylinder	b.	$\pi r^2 h$
3. Sphere	c.	$\frac{2}{3}\pi r^3$
4. Hemisphere	d.	$\frac{1}{3}\pi r^2 h$
	e.	$\frac{1}{3}\pi r^2 l$

A. 1-d,2-b,3-a,4-e

B. 1-d,2-b,3-a,4-c

C. 1-e,2-b,3-a,4-c

D. 1-e,2-d,3-a,4-b

Answer: B

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10. If m and n are the roots of the quadratic equation $x^2 + px + 8 = 0$ with m- n = 2, then the value of p' is

A. ± 8

B. ± 7

C. ± 6

D. ± 5

Answer: C

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11. The sum of the numerator and the denominator of a fraction is equal to 7. Four times the numerator is 8 less than 5 times the denominator. Then, the fraction is

A. $\frac{2}{5}$

B. $\frac{1}{6}$

C. $\frac{5}{2}$

D. $\frac{3}{4}$

Answer: D

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12. Every person in a room , shake hands with every other person . The total number of handshakes it 45. The number of person in the room is .

A. 5

B. 10

C. 15

D. 20

Answer: B

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13. If $x(x-2)=1$, then the value of $x^2+\frac{1}{x^2}$ is .

A. 0

B. 2

C. 4

D. 6

Answer: D

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14. The value of $\tan 7^\circ \tan 23^\circ \tan 39^\circ \tan 60^\circ \tan 51^\circ \tan 67^\circ \tan 83^\circ$ is

A. 0

B. 1

C. $\sqrt{3}$

D. $\frac{1}{\sqrt{3}}$

Answer: C

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15. If one root of the equation $x^2 + ax + b = 0$ is 1/3 times the other. Then, the correct relation between a and b

A. $3a^2 = 16b$

B. $16a^2 = 3b$

C. $3a = 16b^2$

D. $16a = 3b^2$

Answer: A

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16. The area of the triangle with vertices at the points $(a, b + c), (b, c + a), (c, a + b)$ is

A. $\frac{a + b + c}{2}$

B. $\frac{abc}{2}$

C. 1

D. 0

Answer: D

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17. If $y = m + m^2 + m^3 + \ldots\ldots\infty$ when $|m| < 1$, then the value of 'm' is .

A. $\frac{y}{1-y}$

B. $\frac{y}{1+y}$

C. $\frac{1-y}{y}$

D. $\frac{1+y}{y}$

Answer: B

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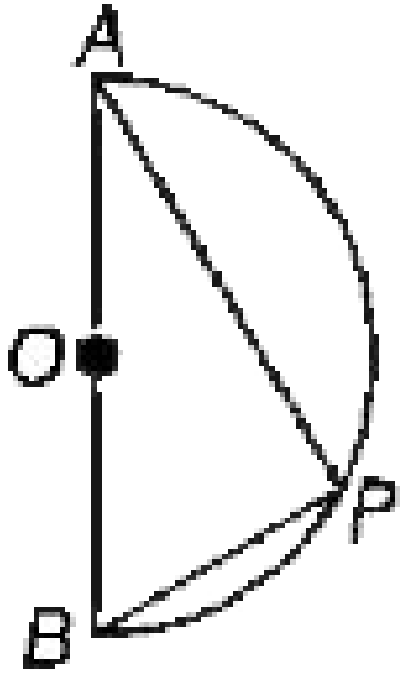
18. In the figure, a semicircle with centre O is drawn on AB= 8 cm. IF $\Delta ABP = 60^\circ$, then

the area of ΔABP is



A. $\frac{\sqrt{3}}{8}cm^2$

B. $8cm^2$

C. $8\sqrt{3}cm^2$

D. $4\sqrt{3}cm^2$

Answer: C

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19. The top of a partially broken tree touches the ground at a point 10 m from the foot of it and makes an angle of elevation of 30° from the ground. The height of the

A. $\frac{10}{\sqrt{3}}m$

B. $10\sqrt{3}m$

C. $\frac{\sqrt{3}}{10}m$

D. $\sqrt{3}$m

Answer: A

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20. If the quadratic equation $4x^2 - (p-2)x + 1 = 0$ has equal roots, then the value of 'p' are

A. $2 \text{ or } 6$

B. $2 \text{ or } -6$

C. -2 or -6

D. -2 or 6

Answer: D

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21. The quadrilateral obtained by joining the points (1,1),(-1,5), (7,9) and (9,5) is

A. Square

B. Rhombus

C. Rectangle

D. Parallelogram

Answer: C

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22. The linear equation coincide with the line $2x + 3y = 12$ is

A. $2x + 3y = 15$

B. $7 \times + 14y = 13$

C. $8x + 12y = 48$

D. $8x + 10y = 18$

Answer: C

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23. If $\tan\theta = -\frac{4}{3}$, then $\sin\theta$ is

A. $\frac{4}{15}$

B. $\pm\frac{4}{5}$

C. $\frac{-4}{5}$ but and $\frac{4}{5}$

D. $\frac{4}{5}$ but not $\frac{-4}{5}$

Answer: B

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24. If $\sin(3A - B) = 1$ and $\cos(2A - B) = \frac{\sqrt{3}}{2}$, then the value of sin A and cos B are .

A. $\frac{\sqrt{3}}{2}, 0$

B. $\frac{1}{2}, 0$

C. $\frac{\sqrt{3}}{2}, 1$

D. $\frac{1}{2}, 1$

Answer: A

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25. An arc subtended an angle 60° at the center of c circle of radius 6 cm , then length of minor and major arc

A. 2π and 10π

B. 10π and 2π

C. 8π and 4π

D. 4π and 6π

Answer: A

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26. If $p+q=6$ and $pq=8$, then p^3+q^3 is equal to

A. 216

B. 144

C. 72

D. 36

Answer: C

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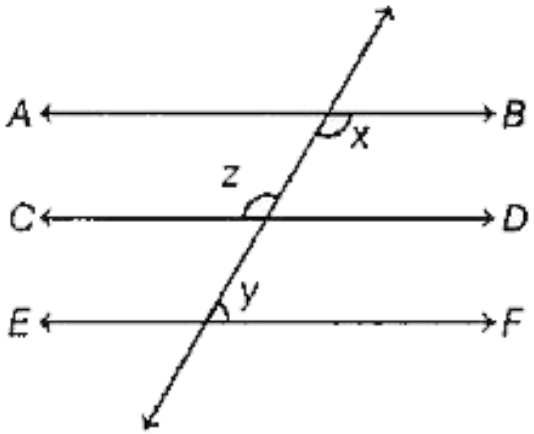
27. In the figure if $AB||CD, CD||EF$ and $x : y = 3 : 2$, then z is equal to .



A. 36°

B. 72°

C. 144°

D. 108°

Answer: D

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28. In two concentric circles of radii 15 cm and 9 cm , then length of a biggest chord of the larger circle which is a tangent to the smaller circle is .

A. 24cm

B. 20 cm

C. 12 cm

D. 10 cm

Answer: A

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29. When $\left(\frac{81}{16}\right)^{\frac{-3}{4}} \times \left\{\left(\frac{9}{25}\right)^{\frac{5}{2}} \div \left(\frac{5}{2}\right)^{-3}\right\}$ is simplified , we get .

A. $\frac{125}{27}$

B. $\frac{27}{125}$

C. 1

D. $\frac{9}{25}$

Answer: $\frac{9}{25}$

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30. The reflection of the point $(-3, -2)$ about Y - axis is

A. $(3, -2)$

B. $(-3, 2)$

C. $(3, 2)$

D. $(0, -2)$

Answer: A

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31. A rational number between $\frac{5}{7}$ and $\frac{9}{11}$ is .

A. $\frac{59}{77}$

B. $\frac{31}{77}$

C. $\frac{23}{11}$

D. $\frac{7}{9}$

Answer: A

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32. If $a = 2, b = 3,$ then $\left(a^b + b^a\right)^{-1}$ is :

A. 17

B. 72

C. $\frac{1}{17}$

D. $\frac{1}{12}$

Answer: C

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33. If $f(x) = x^2 - 5x + 7$, then $f(2) - f(-1)$ is equal to .

A. -34

B. 34

C. 12

D. -12

Answer: D

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34. Find the products:

$$\left(x-\frac{1}{x}\right)\left(x+\frac{1}{x}\right)\left(x^2+\frac{1}{x^2}\right)\left(x^4+\frac{1}{x^4}\right)$$

A. 1

B. $x^8-\frac{1}{x^8}$

C. $x^8+\frac{1}{x^8}$

D. $x^{16}-\frac{1}{x^{13}}$

Answer: A

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35. The mean of 15 observation is 23. If each obsevation is multiplied 2, then new mean is .

A. 23

B. 46

C. 25

D. 36

Answer: B

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36. There are 13 girls and 15 boys in a line . If one students is chosen at random , then the probability that he is not a boy is .

A. $\frac{1}{15}$

B. $\frac{13}{28}$

C. $\frac{1}{18}$

D. $\frac{1}{13}$

Answer: B

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37. Which one of the following are not the sides of a triangle ?

A. 2 cm , 3 cm , 5 cm

B. 5 cm , 4 cm , 8 cm

C. 8 cm , 3 cm , 9 cm

D. 9 cm ,4 cm ,11cm

Answer: B

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38. 1,3,6,10.....are triangular numbers . The smallest triangular number that exactly divisible by 9 is .

A. 18

B. 27

C. 36

D. 45

Answer: A

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39. The sum of two number is 161. If one of the numbers is 30% more than the other , then the numbers are

A. 71 and 90

B. 70 and 91

C. 54 and 107

D. 60 and 101

Answer: C

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40. The common factor of $\left(p^2+9p+14\right)$ and $\left(p^2+13p+42\right)$ is .

A. p+2

B. p+6

C. p+3

D. p+7

Answer: B

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41. Pramod and Praveen are the sons of Prajwal . The present age of Prajwal is 4 time the age of Pramod and 6 time the age of Praveen. If the sum of their ages is equal to 51 yr, then the present ages of sons are .

A. 9 yr and 6yr

B. 8 yr and 9 yr

C. 9 yr and 4yr

D. 5 yr and 9 yr

Answer: D

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42. In a cirlce inscribed in ΔMNO having MN = 12 cm MO= 14 cm and NO = 18 cm touching sides at P,Q andR then $MP + NQ + RO$ is

A. 18 cm

B. 20 cm

C. 22 cm

D. 44 cm

Answer: C

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43. The angle between the hands of a clock when the time 4'O clock is ,

A. 60°

B. 90°

C. 150°

D. 120°

Answer: D

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44. If $\sin\theta + \cos ec\theta = 2$, then $\sin^2\theta + \cos ec^2\theta$ is equal to

A. 4

B. 3

C. 2

D. 1

Answer: C

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45. Two vertices of a triangle are (1,3) and (4,-5) . If its centroid is (7,2) , then the third vertex is

A. (16,8)

B. (8,12)

C. (12,8)

D. (8,16)

Answer: A

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46. Which one of the following is always true with respect to parallel lines ?

A. Sum of their slopes is zero

B. Difference of their slopes is zero

C. Product of their slopes is zero

D. Quotient of their slopes is -1

Answer: B

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47. When $\frac{2\sin 60^\circ \cos 30^\circ \cos ec45^\circ}{\tan 45^\circ \cos 60^\circ \sin 45^\circ}$ is simplified , we get

A. 6

B. $3\sqrt{2}$

C. $\frac{3}{\sqrt{2}}$

D. $\frac{3\sqrt{2}}{2}$

Answer: A

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48. The sum of first 20 odd natural numbers is

A. 210

B. 250

C. 200

D. 400

Answer: D

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