



# MATHS

## BOOKS - ARIHANT PUBLICATION

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## MODEL SOLVED PAPER 2017

### Section Iii Mathematics

1. The value of a and b in  $3\frac{7}{a} \times b\frac{3}{15} = 8$  is equal to

A. 2,11

B. 11, 2

C. 1,1

D. 2,1

**Answer: B**



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2. The HCF of  $p(x) = 24(6x^4 - x^3 - 2x^2)$  and  $q(x) = 20(2x^6 + 3x^5 + x^4)$  is

A.  $4x^2(2x + 1)$

B.  $6x^3(2x - 1)$

C.  $6x^2(2x + 1)$

D.  $4x^2(2x - 1)$

**Answer: A**



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3. If  $3^{2n-1} = \frac{1}{27^{n-3}}$ , then the value of n is

A. 5

B. 3

C. 6

D. 2

**Answer: D**



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4. If  $\tan \theta + \sin \theta = m$  and  $\tan \theta - \sin \theta = n$ ,  
then find the value of  $m^2 - n^2$ .

A.  $\sqrt{ab}$

B.  $4\sqrt{ab}$

C.  $4ab$

D.  $ab$

**Answer: B**



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5. The curved surface area of a cylinder is  $1320 \text{ cm}^2$  and its base had diameter 21cm. Find the height and the volume of the cylinder.

A. 10 cm

B. 20 cm

C. 22 cm

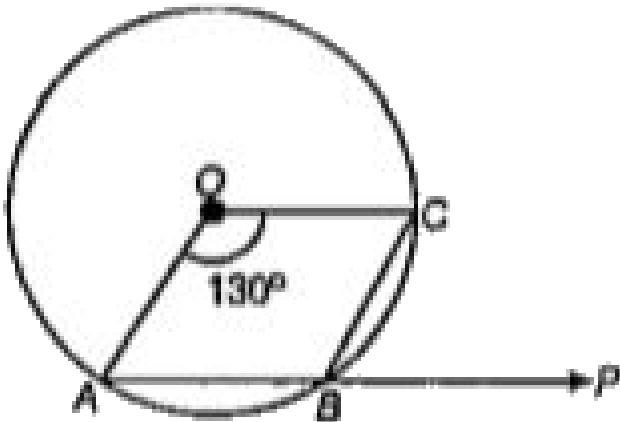
D. 25 cm

**Answer: B**



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6. In the given figure,  $O$  is the centre of a circle and arc  $ABC$  subtends an angle of  $130^\circ$  at  $O$ .  $AB$  is extended to  $P$ . Then,  $\angle PBC$  is equal to



A.  $25^\circ$

B.  $40^\circ$

C.  $65^\circ$

D.  $75^\circ$

**Answer: C**



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7. Four bells ring at intervals of 4, 6, 8 and 14 seconds. They start ringing simultaneously at 12.00 O' clock. At what time will they again ring simultaneously?

A. 2 min 48s past 12

B. 3 min past 12

C. 3 min 20s past 12

D. None of these

**Answer: A**



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8. If  $8\sin x - 4 = \cos x$ , the values of  $\sin x$  are

A.  $\frac{3}{5}, \frac{-5}{13}$

B.  $\frac{-3}{5}, \frac{-5}{13}$

C.  $\frac{3}{5}, \frac{5}{13}$

D.  $\frac{5}{3}, \frac{5}{13}$



**Answer: C**



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9. A conical tent of a diameter 24 m at the base and its height 16 m. The canvas required to make it is

A.  $\frac{5280}{7}m^2$

B.  $\frac{5180}{7}m^2$

C.  $\frac{4180}{7}m^2$

D.  $\frac{3480}{7}m^2$

**Answer: A**



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10. In how many different ways can the letters of the word 'ABILITY' be arranged?

A. 5040

B. 720

C. 1260

D. None of these

**Answer: D**



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11. Vinita bought a watch with 24% discount on the selling price. If the watch cost her Rs 779. What is the original selling price of the watch?

A. Rs 1000

B. Rs 950

C. Rs 1040

D. None of these

**Answer: D**



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12. Find the average of the following sets of scores.

178,863,441,626,205,349,462,820

A. 505

B. 441

C. 349

D. 493

**Answer: D**



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13. The difference between 38% of a number and 24% of the same number is 135.10. What is 40% of that number?

A. 394

B. 370

C. 378

D. 386

**Answer: D**



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14. Krishan has some hens and some cows. If the total number of animal heads is 59 and the total number of feet is 190, how many cows does Krishan have? (a) 23 (b) 32 (c) 36 (d) Cannot be determined

A. 36

B. 32

C. 23

D. Cannot be determined

**Answer: A**



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15. If the numerator of a fraction is increased by 200% and the denominator is increased by 160%, the resultant fraction is  $\frac{7}{13}$ . What is the original fraction?

A.  $\frac{7}{15}$

B.  $\frac{2}{15}$

C.  $\frac{8}{15}$

D.  $\frac{5}{7}$

**Answer: A**



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16. Find the measure of an angle if seven times its complement is  $10^\circ$  less than three times its supplement .

A.  $30^\circ$

B.  $35^\circ$

C.  $25^\circ$

D.  $20^\circ$

**Answer: C**



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17. The age of a man after 15 yr is 4 times the age of that man 15 yr before. His present age is

A. 10yr

B. 15yr

C. 20yr

D. 25yr

**Answer: D**



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18. If  $n$  coins each of diameter 1.5 cm and thickness 0.2 cm are melted and a right circular cylinder of height 10 cm and diameter 5 cm is made, then  $n$  is equal to

A. 336

B. 450

C. 512

D. 555

**Answer: D**



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19. The value of

$$\frac{-\tan \theta \cot(90^\circ - \theta) + \sec \theta \operatorname{cosec}(90^\circ - \theta) + \sin^2 55^\circ + \cos^2 55^\circ}{\tan 10^\circ \tan 20^\circ \tan 30^\circ \tan 70^\circ \tan 80^\circ}$$

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

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

C.  $-\frac{1}{\sqrt{3}}$

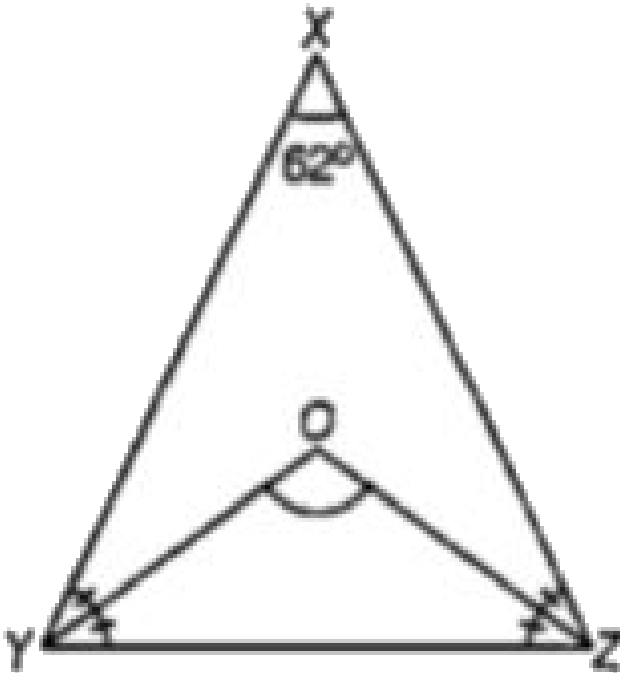
D.  $\sqrt{3}$

**Answer: D**



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20. In figure,  $\angle X = 62^\circ$ ,  $\angle XYZ = 54^\circ$ . If YO and ZO are bisectors of  $\angle XYZ$  and  $\angle XZY$  respectively of  $\triangle XYZ$  then  $\angle YOZ$  is



A.  $90^\circ$

B.  $124^\circ$

C.  $31^\circ$

D.  $121^\circ$

**Answer: D**



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21. If  $\frac{\tan 26^\circ + \tan 19^\circ}{x(1 - \tan 26^\circ \tan 19^\circ)} = \cos 60^\circ$ , then the value of  $x$  is

A. 1

B.  $\sqrt{2}$

C. 2

D.  $\sqrt{3}$

**Answer: C**



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**22.** Sita can do a work in 15 days and Gita can do it in 25 days and Meera in 30 days. How long will they take to do the work, if they work together?

A. 7 days

B. 6 days

C.  $7/50$  days

D. None of these

**Answer: D**



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23. A field is in the form of a circle. The cost of ploughing the field at Rs. 1.50 per  $m^2$  is Rs. 5775. The cost of fencing the field at Rs. 8.50 per m

A. Rs 1870

B. Rs 2870

C. Rs 1970

D. Rs 2970

**Answer: A**



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**24.** The length and breadth of a room are 13 m and 7.5 m, respectively. The floor of the room is to be paved with square tiles of uniform size. Determine the length of the largest possible size of the tile.

A. 1.0 m

B. 0.5 m



C. 1.5 m

D. 5.0 m

**Answer: B**



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**25.** If the area of a circle is  $220\text{cm}^2$ , then area of a square inscribed in this circle is

A.  $160\text{cm}^2$

B.  $175\text{cm}^2$

C.  $140\text{cm}^2$

D.  $180\text{cm}^2$

**Answer: C**



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**26.** In a polygon the number of diagonals is 54. the number of sides of the polygon, is

A. 10

B. 12

C. 9

D. None of these

**Answer: B**



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27. A jar contained a mixture of two liquids A and B in the ratio 4 : 1. When 10 L of the mixture was taken out and 10 L of liquid B was poured into the jar, this ratio becomes 2 : 3. The quantity of liquid A contained in the jar initially was

A. 4L

B. 8L

C. 16L

D. 40L

**Answer: D**



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**28.** If for a line  $m = \tan \theta > 0$ , then

A.  $\theta = 0$

B.  $\theta$  is acute

C.  $\theta = 90^\circ$

D.  $\theta$  is obtuse

**Answer: B**



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**29.** Four horses are tethered at four corners of a square plot of side 63 m, so that they just cannot reach one another. The area left ungrazed is

A.  $675.5m^2$

B.  $780.6m^2$

C.  $785.8m^2$

D.  $850.5m^2$

**Answer: D**



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**30.** The sum of the two numbers is 11 and their product is 30, then the numbers are

A. 8,3

B. 9,2

C. 7,4

D. 6,5

**Answer: D**

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31. Vertices of a  $\triangle ABC$  are  $A(2, 2)$ ,  $B(-4, -4)$  and  $C(5, -8)$ , then the length of the median through  $C$  is

A.  $\sqrt{65}$

B.  $\sqrt{117}$

C.  $\sqrt{85}$

D.  $\sqrt{113}$

**Answer: C**

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**32.** What is the sum of all the natural numbers from 1 to 40?

A. 730

B. 820

C. 850

D. 920

**Answer: B**



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33. If the mean of the following data is 13.5, then the value of  $p$  is

$x$	5	10	$p$	20	25
$f$	10	10	10	2	8

- A. 15
- B. 150
- C. 10
- D. None of these

**Answer: A**



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**34.** If the mean of five observations  $x, x + 2, x + 4, x + 6, x + 8$  is 11, then the mean of the first three observations is

A. 9

B. 11

C. 13

D. None of these

**Answer: A**



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**35.** A fast train takes 2 h less for a journey of 300 km in comparison to a slow train whose speed is 5 km/h less than that of the fast train. The speed of the fast train is equal to

A. 30 km/h

B. 25 km/h

C. 40 km/h

D. 45 km/h

**Answer: A**



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**36.** If  $(41)^2$  is added to the square of a number the answer, so obtained is 7457. What is the number?

A. 76

B. 63

C. 81

D. 82

**Answer: A**



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37. The compound interest on Rs 2000 for 1 year at the rate of 8% per annum, when the interest is compounded semiannually the compound interest is

A. Rs 163.20

B. Rs 2163.20

C. Rs 2000

D. None of these

**Answer: A**



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38.

If

$$A = \{1, 4, 7, 8\}, B = \{4, 6, 8, 9\} \text{ and } C = \{3, 4, 5, 7\}$$

be three subsets of a universal set

$$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}. \text{ Then, } A \cup (B \cap C')$$

equal to

A.  $\{1, 6, 7, 8, 9\}$

B.  $\{1, 6, 7, 8, 9, 3\}$

C.  $\{1, 4, 6, 7, 8, 9\}$

D. None of these

**Answer: C**



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39. If  $\log_x(8x - 3) - \log_x 4 = 2$ , then the value of  $x$  is

A.  $\frac{3}{2}$

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

C. 0

D. 3

**Answer: A**



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40. The expression to be added to  $(5x^2 - 7x + 2)$  to produce  $(7x^2 - 1)$  is

A.  $2x^2 + 7x - 3$

B.  $2x^2 + 3$

C.  $2x^2 - 3$

D.  $2x^2 + 7x$

**Answer: A**



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41. If a flag-staff of 6 m high placed on the top of a tower throws a shadow of  $2\sqrt{3}$  m along the ground, then the angle that the sun makes with the ground is

A.  $60^\circ$

B.  $30^\circ$

C.  $90^\circ$

D. None of these

**Answer: A**



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42. A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place? 2. *4km* b. 2. *5 km* c. *3 km* d. 3. *6 km*

A. 2.4 km

B. 2.5 km

C. 3 km

D. 3.6 km

**Answer: A**



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**43.** A certain amount was divided between A and B in the ratio 4:3. If B's share was Rs. 4800, the total amount was :

A. Rs 11200

B. Rs 6400

C. Rs 19200

D. Rs 39200

**Answer: A**



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44. The value of  $k$  for which the lines  $x + 2y = 9$  and  $kx + 4y = -5$  are parallel, is

A.  $k = 2$

B.  $k = 1$

C.  $k = -1$

D.  $k = -2$

**Answer: A**



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45. A rectangular water tank is 3m long, 2m wide and 5 m high. How many litres of water can it hold?

A. 30000

B. 15000

C. 25000

D. 35000

**Answer: A**



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46. Minimum value of  $x^2 + \frac{1}{x^2 + 1} - 3$  is

A. 0

B.  $-1$

C.  $-3$

D.  $-2$

**Answer: D**



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**47.** The amount of a certain sum at compound interest for 2 year at 5% is Rs 4410. The sum is

A. Rs 4000

B. Rs 4200

C. Rs 3900

D. Rs 3800

**Answer: A**



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**48.** The side (in cm) of a right triangle are  $x - 1$ ,  $x$  and  $x + 1$ . The area of triangle is

A.  $5\text{cm}^2$

B.  $3\text{cm}^2$

C.  $6\text{cm}^2$

D. None of these

**Answer: C**



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49.  $x - y = 2$  and  $xy = 24$ , find  $\frac{1}{x} + \frac{1}{y}$

A.  $\frac{5}{12}$

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

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

D.  $\frac{25}{6}$



**Answer: A**



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**50.** The factors of  $x^4 + x^2 + 25$  are

$$(x^2 + 3x + 5)(x^2 - 3x + 5)$$

$$(x^2 + 3x + 5)(x^2 + 3x - 5)$$

$$(x^2 + x + 5)(x^2 - x + 5) \text{ (d) none of these}$$

A.  $(x^2 + 5 - 3x)(x^2 + 5x - 3)$

B.  $(x^2 + 5 - 3x)(x^2 + 5 + 3x)$

C.  $(x^2 + 5 - 3x)(x^2 + 5 - 3x)$

D. None of these

**Answer: B**



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