



MATHS

BOOKS - OSWAL PUBLICATION

SAMPLE PAPER 7

Question Bank

1. Write the equation of a line parallel to the X-axis.

A. $x=a$

B. $y=a$

C. $x=-a$

D. $x=0$

Answer: B



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2. What is the smallest even composite number?

A. 2

B. 3

C. 7

D. 4

Answer: D



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3. If $\sin \theta = \frac{1}{3}$, then find the value of $2 \cot^2 \theta + 2$.

A. 18

B. 36

C. 20

D. 9

Answer: A



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4. A piece of wire 20 cm long is bent into the form of an arc of a circle, subtending an angle

of 60° at its centre. Find the radius of the circle.

A. $\frac{60}{\pi} \text{ cm}$

B. $\frac{20}{\pi} \text{ cm}$

C. $\frac{30}{\pi} \text{ cm}$

D. $\frac{15}{\pi} \text{ cm}$

Answer: A



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5. Find the value of $9 \sec^2 A - 9 \tan^2 A$

A. 1

B. 9

C. -1

D. -9

Answer: B



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6. What are the zeroes of the polynomial

$$(x^2 - 9)?$$

A. (3, 0)

B. (3, -3)

C. (0, 3)

D. (3, 3)

Answer: B



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7. If α, β are the zeroes of a polynomial, such that $\alpha + \beta = 6$ and $\alpha\beta = 4$, then write the polynomial.

A. $x^2 - 6x + 4$

B. $x^2 + 6x + 4$

C. $x^2 + 4x + 6$

D. $x^2 + 4x + 6$

Answer: A



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8. What is the angle described by the minute hand between 4:00 pm and 4:25 pm?

A. 120°

B. 150°

C. 90°

D. 135°

Answer: B



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9. What is the probability of getting exactly one head in tossing a pair of coins?

A. $\frac{1}{2}$

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

C. $\frac{1}{4}$

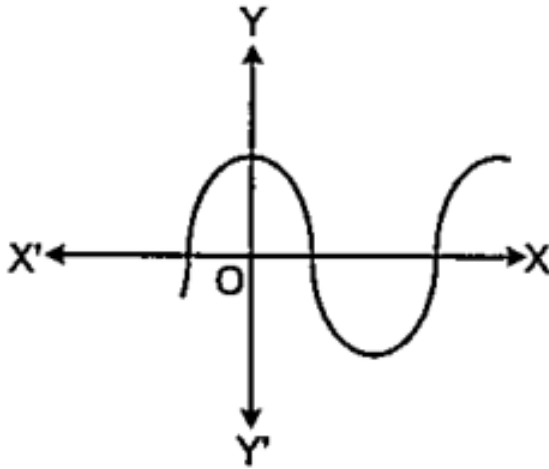
D. 1

Answer: A



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10. What are the number of zeroes of the polynomial $f(x)$ in the given graph?



- A. 1
- B. 2
- C. 3
- D. 0

Answer: C



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11. What is the value of $\tan 30^\circ + \tan 60^\circ$?

A. $\frac{4\sqrt{3}}{3}$

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

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

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

Answer: A



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12. If $\operatorname{cosec} \theta - \cot \theta = \frac{1}{5}$, then the value of $\operatorname{cosec} \theta + \cot \theta$.

A. $\frac{1}{5}$

B. $\frac{1}{25}$

C. $\frac{-1}{25}$

D. 5

Answer: D



13. A boy walks 12 m due east and 5 m due south. How far is he from the starting point?

A. 12 M

B. 17 M

C. 13 M

D. 20 M

Answer: C



14. If two different dice are rolled together, the probability of getting an even number on both dice, is $\frac{1}{36}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{1}{4}$

A. $\frac{1}{4}$

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

C. 1

D. 0

Answer: A



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15. What is the ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal?

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

B. $\frac{\pi}{3}$

C. $\frac{\sqrt{3}\pi}{4}$

D. $\frac{\pi}{2}$

Answer: A



16. A card is drawn from a well shuffled deck of 52 cards. The probability of red queen is :

A. $\frac{2}{13}$

B. $\frac{1}{22}$

C. $\frac{4}{13}$

D. $\frac{1}{26}$

Answer: D



17. If the area and circumference of a circle are numerically equal, then the radius of circle is _____.

A. 2 units

B. 4 units

C. π units

D. 6 units

Answer: A



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18. Find the value of k for which the pair of linear equations $kx + 3y = k-3$, $12x + ky = k$ has no solution.

A. ± 4

B. ± 3

C. ± 6

D. ± 15

Answer: C





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19. If $3 \sec \theta = 5$, then find the value of $\cot \theta$

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

B. $\frac{1}{4}(c)$

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

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

Answer: D



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20. Find the solution of linear equations

$$x + y = 3 \text{ and } 7x + 6y = 2?$$

A. -16, 19

B. 3, 2

C. 11, 9

D. -21, 20

Answer: A



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21. Find the distance between the coordinates
(7, -7) and (15, 8).

A. 13

B. 15

C. 17

D. 12

Answer: C



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22. The sum of exponents of prime factors in the prime-factorisation of 196 is

A. 2

B. 4

C. 6

D. 5

Answer: B



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23. If $\sin A = \frac{3}{4}$, calculate $\sec A$.

A. $\frac{5}{\sqrt{7}}$

B. $\frac{3}{\sqrt{7}}$

C. $\frac{4}{\sqrt{7}}$

D. None of these

Answer: C



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24. The zeroes of the polynomial

$x^2 - 3x - m(m + 3)$ are:

A. $-m, m - 1$

B. $-m, -(m+3)$

C. $m, m+3$

D. $-m, m + 3$

Answer: D



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25. Which of the following is irrational?

A. 3.1415926535

B. 10.2

C. $(0.2)^2$

D. 0.2

Answer: A



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26. Write down the decimal expansions of

$$\frac{13}{6250}$$

A. 0.028

B. 0.00208

C. $\frac{0.005}{2}$

D. $\frac{0.004}{6}$

Answer: B



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27. In $\triangle ABC$ and $\triangle DEF$, it is given that

$$\frac{AB}{DE} = \frac{BC}{FD} \text{ then}$$

A. $\angle A = \angle F$

B. $\angle B = \angle D$

C. $\angle A = \angle D$

D. $\angle B = \angle E$

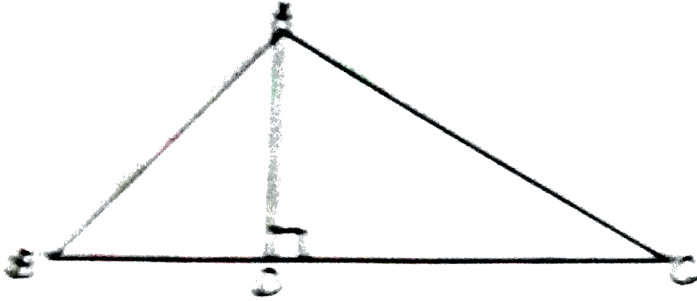
Answer: B



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28. In figure, if $\angle BAC = 90^\circ$ and $AD \perp BC$.

Then,



A. $BD \cdot CD = BC^2$

B. $AB \cdot AC = BC^2$

C. $BD \cdot CD = AD^2$

D. $AB \cdot AC = AD^2$

Answer: C



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29. The probability that cannot exist among the following:

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

B. -1.5

C. 15%

D. 0.7

Answer: B



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30. The point which divides the line segment of points $P(-1, 7)$ and $Q(4, -3)$ in the ratio of $2:3$ is:

A. $(-1, 3)$

B. $(-1, -3)$

C. $(1, -3)$

D. $(1, 3)$

Answer: D



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31. The decimal expansion of $\frac{22}{7}$ is:

- A. terminating
- B. non-terminating and non-repeating
- C. non-terminating and repeating
- D. None of the above

Answer: C



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32. If HCF of 65 and 117 is expressible in the form $65m - 117$, then the value of m is

A. 4

B. 2

C. 1

D. 3

Answer: B



33. Which of the following are not similar figures?

- A. Circles
- B. Squares
- C. Equilateral triangle
- D. Isosceles triangles

Answer: D



34. If $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, which of the following is true?

A. $DE = 12$ cm, $\angle F = 50^\circ$

B. $DE = 12$ cm, $\angle F = 100^\circ$

C. $EF = 12$ cm, $\angle D = 100^\circ$

D. $EF = 12$ cm, $\angle D = 30^\circ$

Answer: B



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35. If one equation of a pair of dependent linear equations is $-3x+5y-2=0$. The second equation will be:

A. $-6x + 10y - 4 = 0$

B. $6x + 10y - 4 = 0$

C. $6x - 10y - 4 = 0$

D. $-6x + 10y + = 0$

Answer: A



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36. The value of $(\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$ is:

A. 10

B. 7

C. 3

D. $\sqrt{3}$

Answer: C



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37. If the centre of a circle is $(3,5)$ and end points of a diameter are $(4,7)$ and $(2, y)$, then the value of y is

A. 4

B. 7

C. 3

D. -3

Answer: C



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38. If $\triangle ABC$ is right angled at C, then the value of $\cos(A+B)$ is

A. 0

B. 1

C. $\frac{1}{2}$

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

Answer: A



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39. 2. $\overline{25}$ is

- A. an integer
- B. a rational number
- C. an irrational number
- D. a natural number

Answer: B



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40. If the sum of the zeroes of the quadratic polynomial $f(x) = mx^2 + 2x + 3m$ is equal to their product, then m equals

A. $\frac{1}{3}$

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

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

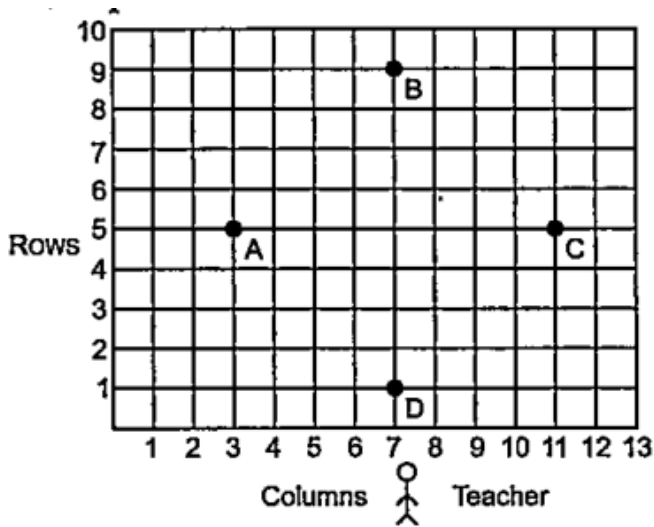
D. $-\frac{1}{3}$

Answer: C



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41. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are the positions of four students as shown in the figure.



The coordinates of A and B respectively is:

A. A(3, 5), B(7, 8)

B. A(5, 3), B(8, 7)

C. A(3, 5), B(7, 9)

D. A(5, 3), B(9, 7)

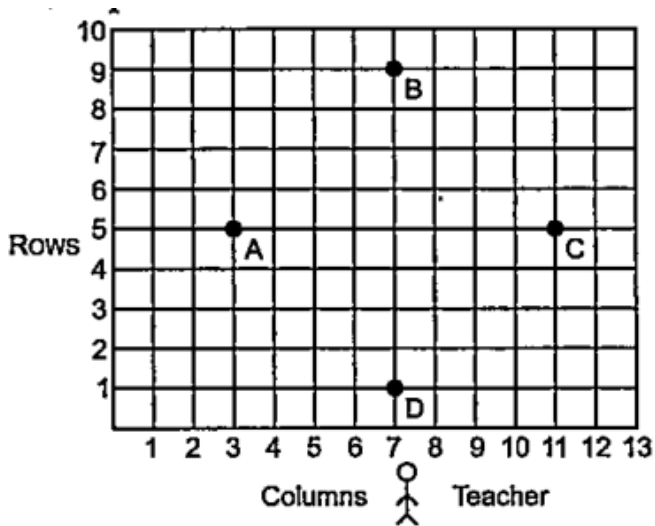
Answer: C



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42. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are

the positions of four students as shown in the figure.



The coordinates of C and D respectively is:

A. C(11, 5), D(7, 1)

B. C(5, 11), D(1, 7)

C. C(5, 11), D(7, 1)

D. $C(5, 11)$, $D(-1, 7)$

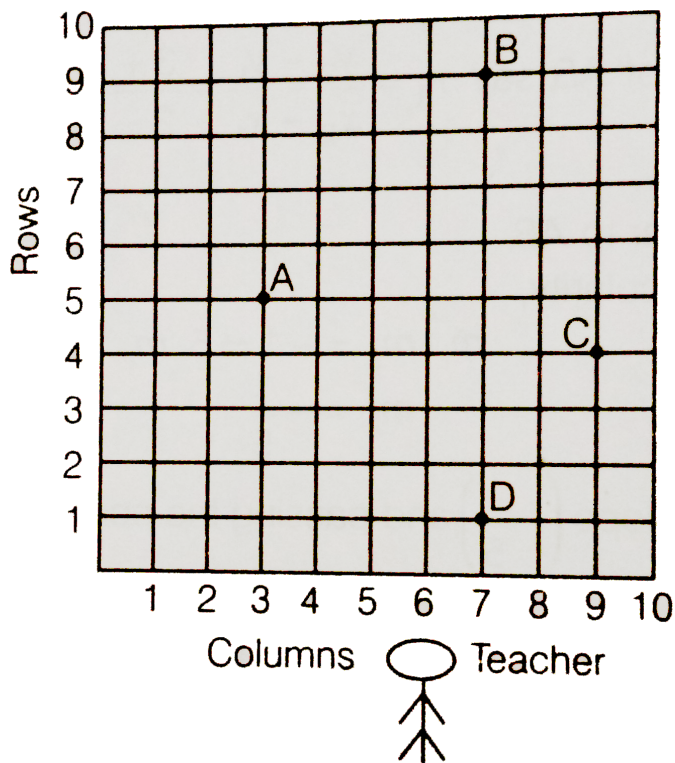
Answer: A



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43. Students of a school are standing in rows and columns in their playground for a drill practice . A, B, C and D are the positions of four students as shown in figure . Is it possible to place Jaspal inn the drill in such a way that he is equidistant from each of the four

students A, B C and D ? If so, what should be his position ?



A. Yes

B. Not possible

C. Not true

D. None

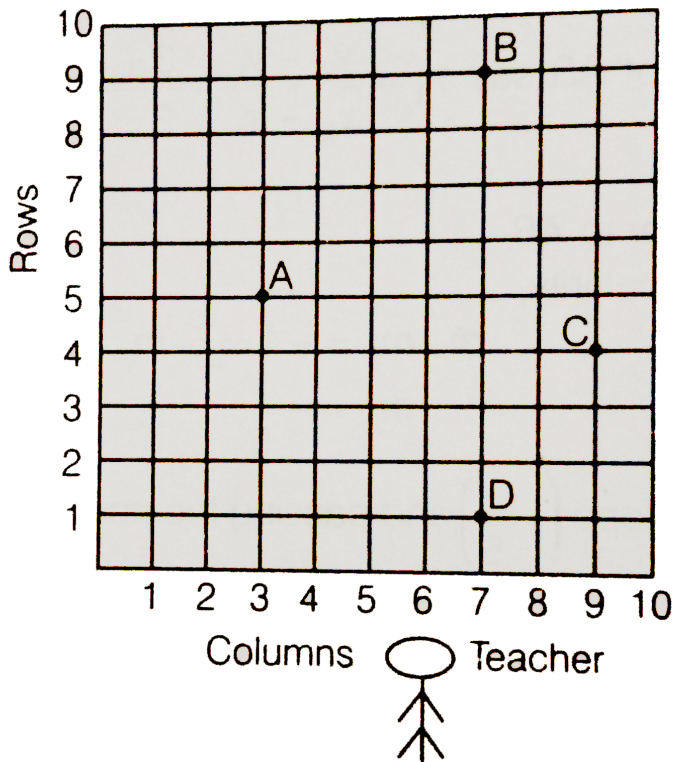
Answer: A



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44. Students of a school are standing in rows and columns in their playground for a drill practice . A, B, C and D are the positions of four students as shown in figure . Is it possible to place Jaspal inn the drill in such a way that

he is equidistant from each of the four students A, B, C and D ? If so, what should be his position ?



A. (7, 5)

B. (5, 7)

C. (7, 7)

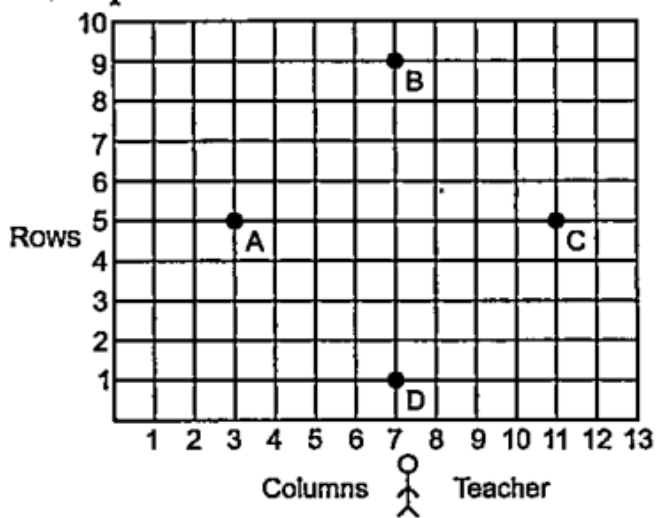
D. (5, 5)

Answer: A



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45. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are the positions of four students as shown in the figure.



The distance between B and D is:

- A. 5 units
- B. 14 units
- C. 8 units
- D. 10 units

Answer: C



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46. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



In each room the same number of participants

are to be seated and all of them being in the same subject, hence maximum number participants that can accommodated in each room are

A. 14

B. 12

C. 16

D. 18

Answer: B



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47. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



What is the minimum number of rooms required during the event?

A. 11

B. 31

C. 41

D. 21

Answer: D



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48. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different

subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



The LCM of 60, 84 and 108 is

A. 3780

B. 3680

C. 4780

D. 4680

Answer: A



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49. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



The product of HCF and LCM of 60,84 and 108
is

A. 55360

B. 35360

C. 45500

D. 45360

Answer: D



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50. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



108 can be expressed as a product of its primes as

A. $2^3 \times 3^2$

B. $2^3 \times 3^3$

C. $2^2 \times 3^2$

D. $2^2 \times 3^3$

Answer: D



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51. Write the equation of a line parallel to the X-axis.

A. $x=a$

B. $y=a$

C. $y=0$

D. $x=0$

Answer: B



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52. What is the smallest composite number:

A. 2

B. 3

C. 7

D. 4

Answer: D



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53. If $\sin \theta = \frac{1}{3}$, then find the value of $2 \cot^2 \theta + 2$.

A. 18

B. 36

C. 20

D. 9

Answer: A



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54. If piece of wire 20 cm long is bent into the form of an arc of a circle subtending an angle of 60° at its centre. The radius of the circle is:

A. $\frac{60}{\pi} \text{ cm}$

B. $\frac{20}{\pi} \text{ cm}$

C. $\frac{30}{\pi} \text{ cm}$

D. $\frac{15}{\pi} \text{ cm}$

Answer: A



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55. Find the value of $9 \sec^2 A - 9 \tan^2 A$

A. 1

B. 9

C. -1

D. -9

Answer: B



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56. What are the zeroes of the polynomial

$$(x^2 - 9)?$$

A. (3, 0)

B. (3, -3)

C. (0, 3)

D. (3, 3)

Answer: B



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57. If α, β are the zeroes of a polynomial such that $\alpha + \beta = 6$ and $\alpha\beta = 4$, then write down the polynomial.

A. $x^2 - 6x + 4$

B. $x^2 + 6x + 4$

C. $x^2 + 4x + 6$

D. $x^2 - 4x + 6$

Answer: A



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58. What is the angle described by the minute hand between 4:00 pm and 4:25 pm?

A. 120°

B. 150°

C. 90°

D. 135°

Answer: B



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59. What is the probability of getting exactly one head in tossing a pair of coins?

A. $\frac{1}{2}$

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

C. $\frac{1}{4}$

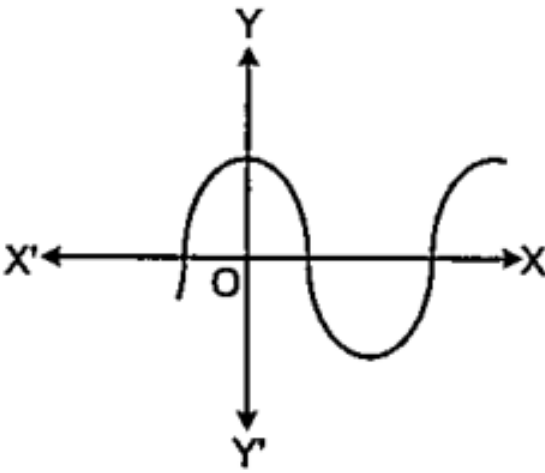
D. 1

Answer: A



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60. What are the number of zeroes of the polynomial $f(x)$ in the given graph?



A. 1

B. 2

C. 3

D. 0

Answer: C



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61. What is the value of $\tan 30^\circ + \tan 60^\circ$?

A. $\frac{4\sqrt{3}}{3}$

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

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

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

Answer: A



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62. If $\operatorname{cosec} \theta - \cot \theta = \frac{1}{5}$, then the value of $\operatorname{cosec} \theta + \cot \theta$.

A. $\frac{1}{5}$

B. $\frac{1}{25}$

C. $\frac{-1}{25}$

D. 5

Answer: D



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63. A boy walks 12 m due east and 5 m due south. How far is he from the starting point?

A. 12 M

B. 17 M

C. 13 M

D. 20 M

Answer: C



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64. If two different dice are rolled together, the probability of getting an even number on both dice, is $\frac{1}{36}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{1}{4}$

A. $\frac{1}{4}$

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

C. 1

D. 0

Answer: A



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65. What is the ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal?

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

B. $\frac{\pi}{3}$

C. $\frac{\sqrt{3}\pi}{4}$

D. $\frac{\pi}{2}$

Answer: A



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66. What is the probability of getting a red queen when a card is drawn from a well shuffled pack of 52 cards?

A. $\frac{2}{13}$

B. $\frac{1}{22}$

C. $\frac{4}{13}$

D. $\frac{1}{26}$

Answer: D



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67. If the perimeter and the area of a circle are numerically equal, then the radius of the circle is.

A. 2 units

B. 4 units

C. π units

D. 6 units

Answer: A



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68. Find the value of k for which the pair of linear equations $kx + 3y = k-3$, $12x + ky = k$ has no solution.

A. ± 4

B. ± 3

C. ± 6

D. ± 15

Answer: C



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69. If $3 \sec \theta - 5 = 0$, then value of $\cot \theta$ is:

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

B. $\frac{1}{4}$

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

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

Answer: D



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70. Find the solution of linear equations

$$x + y = 3 \text{ and } 7x + 6y = 2?$$

A. -16, 19

B. 3, 2

C. 11, 9

D. -21, 20

Answer: A



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71. Find the distance between the coordinates
(7, -7) and (15, 8).

A. 13

B. 15

C. 17

D. 12

Answer: C



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72. What will be the sum of exponents of prime factors in the prime factorisation of 196?

A. 2

B. 4

C. 6

D. 5

Answer: B



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73. If $\sin A = \frac{3}{4}$ calculate $\sec A$.

A. $\frac{5}{\sqrt{7}}$

B. $\frac{3}{\sqrt{7}}$

C. $\frac{4}{\sqrt{7}}$

D. None of these

Answer: C



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74. Evaluate the zeroes of the polynomial

$$x^2 - 3x - m(m + 3).$$

A. $-m, m - 1$

B. $-m, -(m+3)$

C. $m, m+3$

D. $-m, m + 3$

Answer: D



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75. Which among the following options is irrational?

A. 3.1415926535

B. 10.2

C. $(0.2)^2$

D. 0.2

Answer: A



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76. Write down the decimal expansions of

$$\frac{13}{6250}$$

A. 0.028

B. 0.00208

C. $\frac{0.005}{2}$

D. $\frac{0.004}{6}$

Answer: B



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77. In $\triangle ABC$ and $\triangle DEF$, it is given that

$$\frac{AB}{DE} = \frac{BC}{FD} \text{ then}$$

A. $\angle A = \angle F$

B. $\angle B = \angle D$

C. $\angle A = \angle D$

D. $\angle B = \angle E$

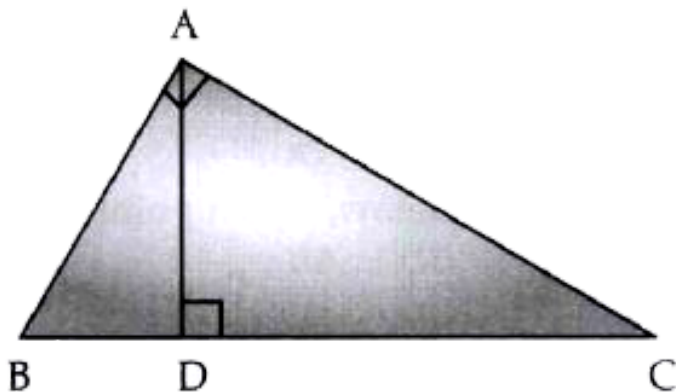
Answer: B



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78. In the figure given below $\angle BAC = 90^\circ$

and $AD \perp BC$. Then



A. $BD \cdot CD = BC^2$

B. $AB \cdot AC = BC^2$

C. $BD \cdot CD = AD^2$

D. $AB \cdot AC = AD^2$

Answer: C



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79. The probability that cannot exist among the following:

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

B. -1.5

C. 15%

D. 0.7

Answer: B



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80. The point which divides the line segment of points $P(-1, 7)$ and $Q(4, -3)$ in the ratio of $2:3$ is:

A. $(-1, 3)$

B. $(-1, -3)$

C. $(1, -3)$

D. $(1, 3)$

Answer: D



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81. The decimal expansion of $\frac{22}{7}$ is:

- A. terminating
- B. non-terminating and non-repeating
- C. non-terminating and repeating
- D. None of the above

Answer: C



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82. If HCF of 65 and 117 is expressible in the form $65m - 117$, then the value of m is

A. 4

B. 2

C. 1

D. 3

Answer: B



83. Which of the following are not similar figures?

A. Circles

B. Squares

C. Equilateral triangle

D. Isosceles triangles

Answer: D



84. If $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, which of the following is true?

A. $DE = 12$ cm, $\angle F = 50^\circ$

B. $DE = 12$ cm, $\angle F = 100^\circ$

C. $EF = 12$ cm, $\angle D = 100^\circ$

D. $EF = 12$ cm, $\angle D = 30^\circ$

Answer: B



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85. If one equation of a pair of dependent linear equations is $-3x+5y-2=0$. The second equation will be:

A. $-6x + 10y - 4 = 0$

B. $6x + 10y - 4 = 0$

C. $6x - 10y - 4 = 0$

D. $-6x + 10y + = 0$

Answer: A



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86. The value of $(\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$ is:

A. 10

B. 7

C. 3

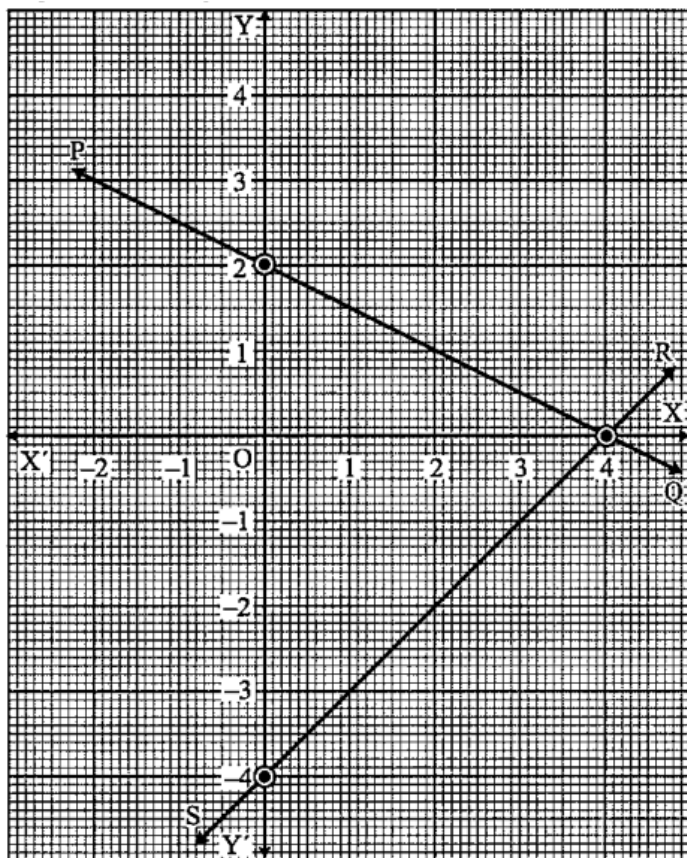
D. $\sqrt{3}$

Answer: C



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87. What is the area of a triangle formed by lines PQ and RS and line $X=0$?



A. 11.5 sq. units

B. 10 sq. units

C. 12 sq. units

D. 9.5 sq. units

Answer: C



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88. If $\triangle ABC$ is right angle at C, then value of $\cos (A+B)$ is:

A. 0

B. 1

C. $\frac{1}{2}$

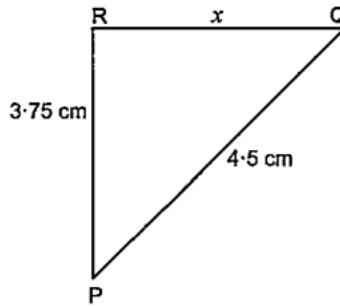
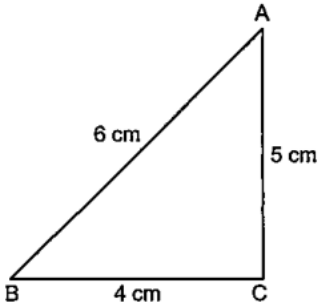
D. $\frac{\sqrt{3}}{2}$

Answer: A



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89. In the given figure $\triangle ABC \sim \triangle PQR$ the value of x is:



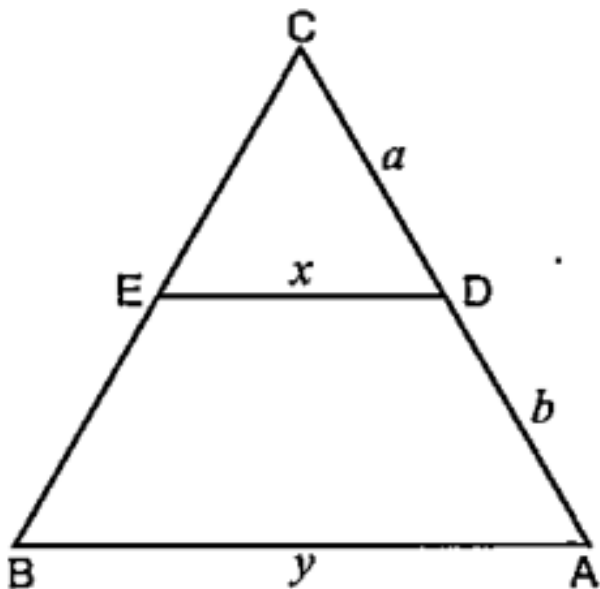
- A. 2.5 cm
- B. 3.5 cm
- C. 2.75 cm
- D. 3 cm

Answer: D



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90. In the given figure, $DE \parallel AB$, which of the following is true?



A. $x = \frac{a + b}{ay}$

B. $y = \frac{ax}{a + b}$

C. $x = \frac{ay}{a + b}$

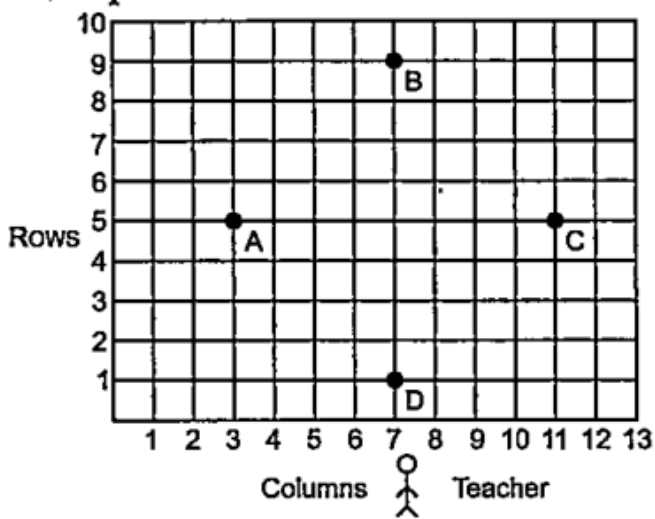
D. $\frac{x}{y} = \frac{a}{b}$

Answer: C



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91. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are the positions of four students as shown in the figure.



The coordinates of A and B respectively is:

A. A(3, 5), B(7, 8)

B. A(5, 3), B(8, 7)

C. A(3, 5), B(7, 9)

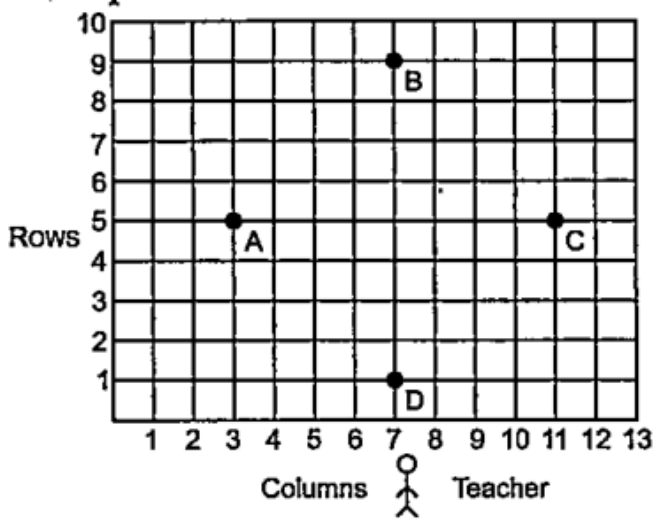
D. A(5, 3), B(9, 7)

Answer: C



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92. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are the positions of four students as shown in the figure.



The coordinates of C and D respectively is:

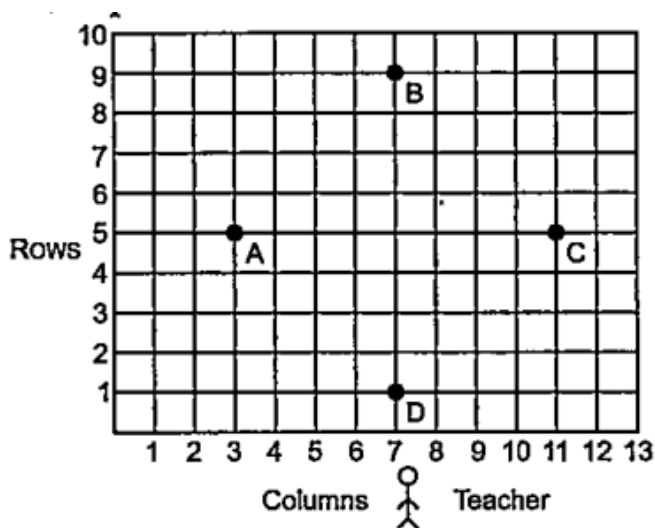
- A. C(11, 5), D(7, 1)
- B. C(5, 11), D(1, 7)
- C. C(5, 11), D(7, 1)
- D. C(5, 11), D(-1, 7)

Answer: A



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93. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are the positions of four students as shown in the figure.



Is it possible to place Ram (R) in the drill in such away that he is equidistant from all the four students A, B, C and D?

A. Yes

B. Not possible

C. Not true

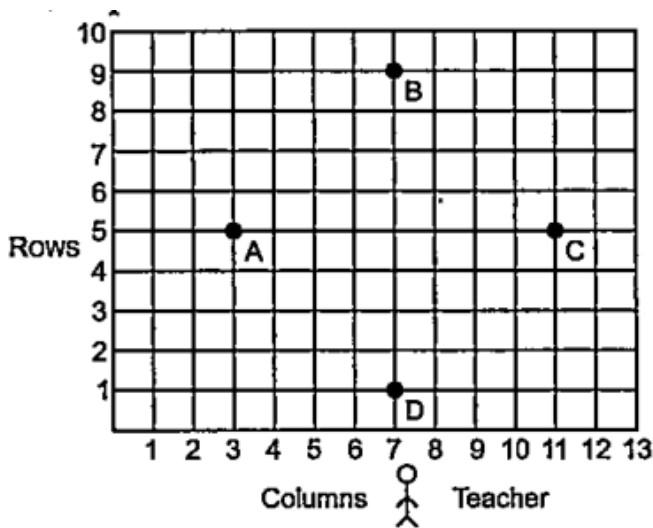
D. None

Answer: A



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94. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are the positions of four students as shown in the figure.



What are the coordinates of the position of Ram?

A. (7, 5)

B. (5, 7)

C. (7, 7)

D. (5, 5)

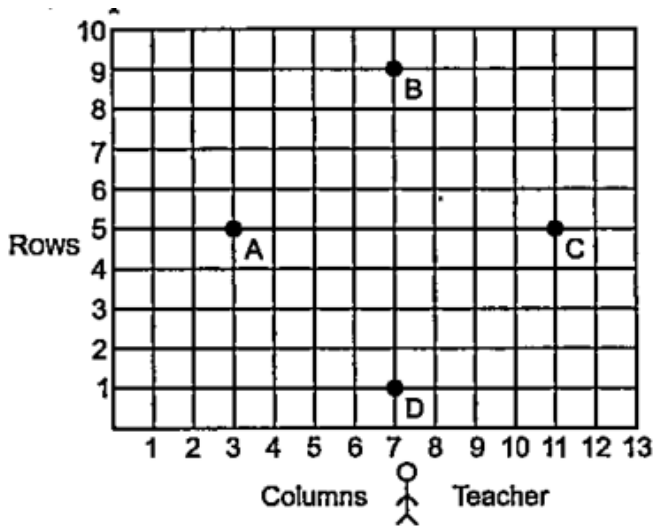
Answer: A



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95. Case Study-1: Students of a school are studying in rows and columns in their playground for a drill practice. A,B,C and D are

the positions of four students as shown in the figure.



The distance between B and D is:

- A. 5 units
- B. 14 units
- C. 8 units

D. 10 units

Answer: C



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96. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



In each room the same number of participants are to be seated and all of them being in the same subject, hence maximum number participants that can accommodated in each room are

A. 14

B. 12

C. 16

D. 18

Answer: B



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97. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



What is the minimum number of rooms required during the event?

A. 11

B. 31

C. 41

D. 21

Answer: D



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98. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



The LCM of 60, 84 and 108 is

A. 3780

B. 3680

C. 4780

D. 4680

Answer: A



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99. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108

respectively.



The product of HCF and LCM of 60,84 and 108
is

A. 55360

B. 35360

C. 45500

D. 45360

Answer: D



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100. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



108 can be expressed as a product of its primes as

A. $2^3 \times 3^2$

B. $2^3 \times 3^3$

C. $2^2 \times 3^2$

D. $2^2 \times 3^3$

Answer: D



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Section A

1. The 4th term of an A.P. is equal to 3 times the first term and 7th term excess with the 3rd term by 1. Find its n^{th} term.



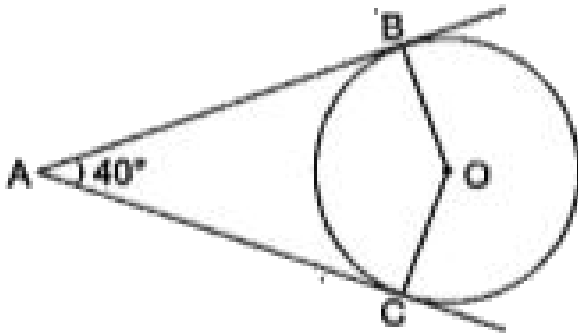
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2. If the quadratic equation $px^2 - 2\sqrt{5}px + 15 = 0$, has two equal roots then find the value of p.



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3. In the given figure, AB and AC are tangents to the circle with centre O such that $\angle BAC = 40^\circ$. Then find the $\angle BOC$.



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4. The diameter of a sphere is 6 cm. It is melted and drawn in to a wire of diameter 2

mm. Find the length of the wire.



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5. Consider the following distribution:

Marks obtained	Number of students
More than or equal to 0	63
More than or equal to 10	58
More than or equal to 20	55
More than or equal to 30	51
More than or equal to 40	48
More than or equal to 50	42

Find the frequency of the class 30 - 40.



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6. If the roots of the equation $(a - b)x^2 + (b - c)x + (c - a) = 0$ are equal, prove that $b + c = 2a$.



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7. Find the value of k for which the equation $x^2 + k(2x + k - 1) + 2 = 0$ has real and equal roots.



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Section B

1. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

Number of mangoes	50 – 52	53 – 55	56 – 58	59 – 61	62 – 64
Number of boxes	15	110	135	115	25

Find the mean number of mangoes kept in a packing box. Which method of finding the mean did you choose?



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2. If the median of the following frequency distribution is 32.5. Find the values of f_1 and f_2 .

Class	Frequency
0 – 10	f_1
10 – 20	5
20 – 30	9
30 – 40	12
40 – 50	f_2
50 – 60	3
60 – 70	2
Total	40



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3. Draw two tangents to a circle of radius 3.5 cm, from a point P at a distance of 6.2 cm from its centre.



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4. The arithmetic mean of the following frequency distribution is 53. Find the value of k .

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	12	15	32	k	13



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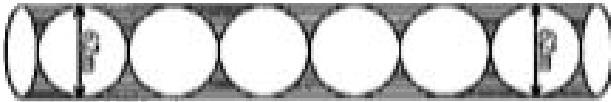
Section C

1. A solid cylinder of diameter 12 cm and height 15 cm is melted and recast into 12 toys in the shape of a right-circular cone mounted on a hemisphere. Find the radius of the hemisphere if the height of the cone is 3 times the radius.



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2. Six tennis balls of diameter 62 mm are placed in cylindrical tube. Find the volume of the six balls and the internal volume of unfilled space in the tube and express this as a percentage of the volume of the tube.



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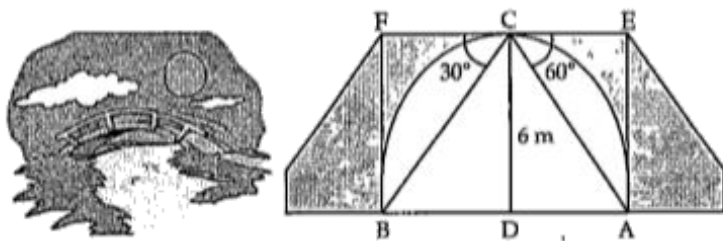
3. Out of the two concentric circles, the radius of the outer circle is 5 cm and the chord AC of

length 8 cm is a tangent to the inner circle.

Find the radius of the inner circle.

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4. One day while sitting on the bridge across a river Aaradhya observes the angles of depression of the banks on opposite sides of the river to be 30° and 60° respectively as shown in the figure. (Take $\sqrt{3} = 1.73$)



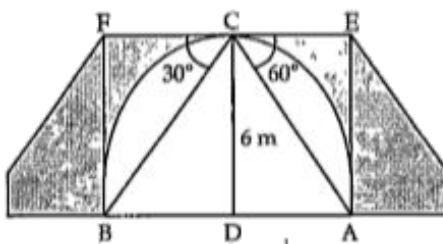
Based on the above information, answer the following questions :

If the bridge is at a height of 6 m, then find AD.



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5. One day while sitting on the bridge across a river Aaradhya observes the angles of depression of the banks on opposite sides of the river to be 30° and 60° respectively as shown in the figure. (Take $\sqrt{3}=1.73$)



Based on the above information, answer the following questions :

What is the width of the river ?

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6. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production

runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions :

Find the production for first year.

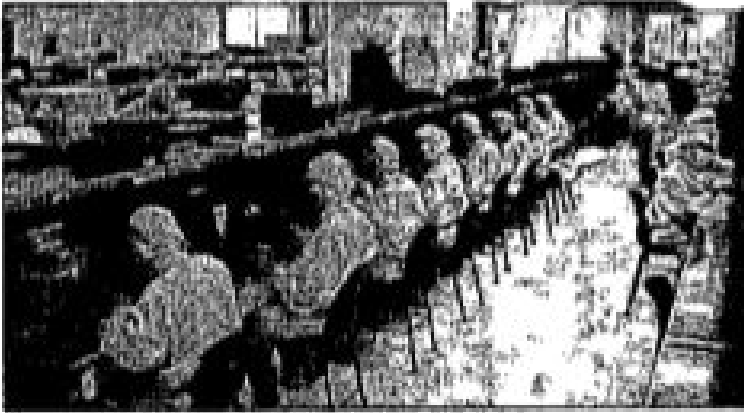


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7. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

Based on the above information, answer the following questions :

In which year, the production is 29,200.



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