



MATHS

BOOKS - AGRAWAL PUBLICATION

Sample paper 5

Exercise

1. Find irrational number between 2 and 3.



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2. Reduce the equation

$$y(2y + 15) = 3(y^2 + y + 8)$$

to the standard form.



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3. The n^{th} term of an A.P. cannot be $n^2 + 1$.

Justify the statement.



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4. Check whether $x = 2$ and $y = 3$ the solution of the pair of linear equations:

$$x - 3y = 2, 6y - 2x = 5$$



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5. Find the distance between $(7,0)$ and $(1, - 8)$.



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6. A line of length 10 units has one end at the point $(-3,2)$. If the ordinate of the other end is 10, show that the abscissa will be 3 or -9.



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7. If $\triangle ABC \sim \triangle DEF$, such that $\angle A = 47^\circ$ and $\angle E = 83^\circ$, what is the value of $\angle C$?



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8. Find the zeros of $2x^2 - x - 45$.



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9. If $\cot A + \frac{1}{\cot A} = 2$, then $\cot^2 A + \frac{1}{\cot^2 A}$ is equal to



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10. If $\sin A = \frac{1}{2}$ then what is the value of $(\cot A - \cos A)$?





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11. From a group of 4 girls and 6 boys, a child is selected. Find the probability that the selected child is a girl.



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12. What is the perimeter of a quadrant of a circle of radius 'r' ?



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13. The total surface area of a solid hemisphere of radius r is



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14. Two coins are tossed simultaneously. Find the probability of getting at least one head.



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15. A cubic polynomial can have at most how many zeros?



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16. Write the nature of roots of the quadratic equation $ax^2 - 3bx - 4a = 0 (a \neq 0)$?



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17. State the AA criterion of similarity of triangles.



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18. If in $\triangle ABC$, $\angle B = 90^\circ$, $AB = 6\sqrt{3}$ and $AC = 12\text{cm}$, find BC.



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19. From a point Q , the length of the tangent to a circle is 12 cm and distance of d from the centre is 13 cm. Find the radius of the circle.



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20. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward. The more TV's you manufacture in a single run, lower the costs

per unit, which in turn increases your bottom-line margins.

Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000, sets in the 6th year and 11,300 sets in the 9th year.

The company's production of the first year is:

A. 2000

B. 2500

C. 3000

D. 5000

Answer:



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21. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

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increases your bottom-line margins.



Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

The company's production of the 8th year is:

A. 9600

B. 9800

C. 10200

D. 10500

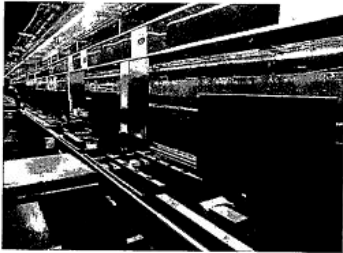
Answer:



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22. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness

can be its own reward. The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.



Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000, sets in the 6th year and 11,300 sets in the 9th year.

The company's total production of the first 6 years is:

A. 28950

B. 30150

C. 30250

D. 31500

Answer:



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23. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.



Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

The company's production increases every year by:

A. 2500

B. 2200

C. 1800

D. 1100

Answer:



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24. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn

increases your bottom-line margins.



Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

In which year the company's production is 9100 sets ?

A. 5^{th}

B. 6^{th}

C. 7^{th}

D. 9^{th}

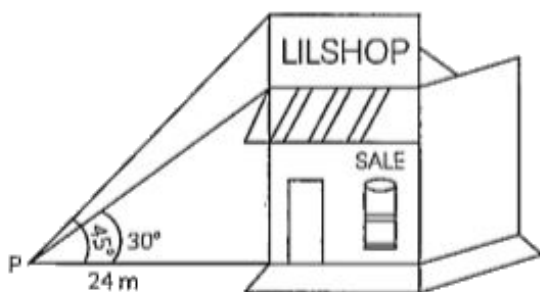
Answer:



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25. Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting

up an advertisement sign for a rental ad
income on the roof of the building.



From a point P on the ground level, the angle
of elevation of the roof of the building is 30°
and the angle of elevation of the top of the

sign board is 45° . The point P is at a distance of 24 m from the base of the building.

The height of the building (without the sign board) is

A. 11 m

B. 14 m

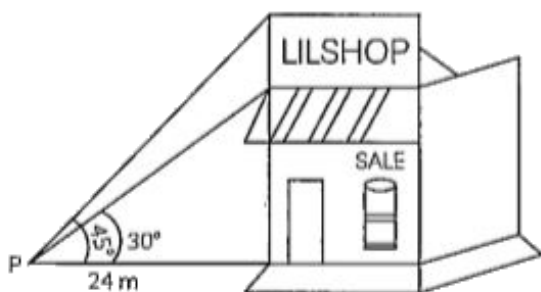
C. 17 m

D. 22 m

Answer:



26. Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.



From a point P on the ground level, the angle of elevation of the roof of the building is 30° and the angle of elevation of the top of the sign board is 45° . The point P is at a distance of 24 m from the base of the building.

The height of the building (with the sign board) is

A. $24\sqrt{3}$

B. $24\sqrt{2}$

C. 24 m

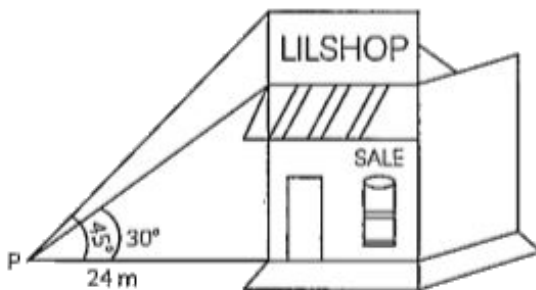
D. 12m

Answer:



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27. Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.



From a point P on the ground level, the angle of elevation of the roof of the building is 30° and the angle of elevation of the top of the sign board is 45° . The point P is at a distance of 24 m from the base of the building.

The height of the sign board is

A. $(24\sqrt{3} - 11)$ m

B. $(24\sqrt{2} - 14)$ m

C. 15 m

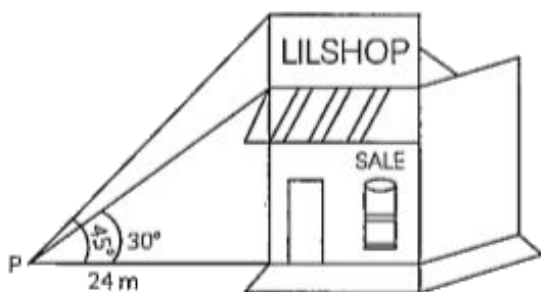
D. 10 m

Answer:



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28. Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.



From a point P on the ground level, the angle of elevation of the roof of the building is 30° and the angle of elevation of the top of the sign board is 45° . The point P is at a distance of 24 m from the base of the building.

On the basis of the above information, answer any four of the following questions:

The distance of the point P from the top of the sign board, is

A. $23\sqrt{3}\text{m}$

B. $24\sqrt{2}\text{m}$

C. 24m

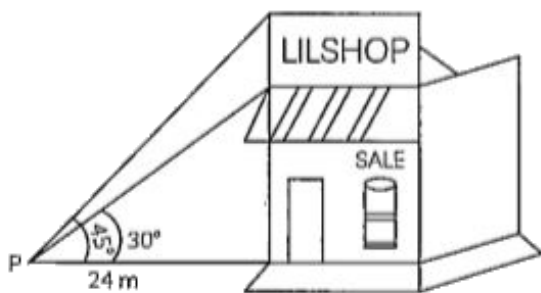
D. 12m

Answer:



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29. Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.



From a point P on the ground level, the angle of elevation of the roof of the building is 30° and the angle of elevation of the top of the sign board is 45° . The point P is at a distance of 24 m from the base of the building.

If the point of observation P is moved 10 m towards the base of the building, then the angle of elevation θ of the roof of the building is given by

A. $\tan \theta = \sqrt{3}$

B. $\tan \theta = \frac{2}{\sqrt{3}}$

C. $\tan \theta = \frac{1}{2}$

D. $\tan \theta = \frac{4\sqrt{3}}{7}$

Answer:



30. As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their locality by planting a number of plants. They involved the school kids and the local community in doing so.



Here is the data indicating the number of plants contributed by different houses:

Number of plants contributed	1-3	4-6	7-9	10-12	13-15	16-18
Number of houses	10	8	x	7	12	4

If the mean number of plants contributed be 8.9, then how many houses contributed 7 to 9 plants?

- A. 6 houses
- B. 7 houses
- C. 8 houses
- D. 9 houses

Answer:



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31. As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their locality by planting a number of plants. They involved the school kids and the local community in doing so.



Here is the data indicating the number of plants contributed by different houses:

Number of plants contributed	1-3	4-6	7-9	10-12	13-15	16-18
Number of houses	10	8	x	7	12	4

9 houses contributed 7 to 9 plants. How many houses of the locality came forward to beautify the primary school?

A. 50 houses

B. 49 houses

C. 48 houses

D. 47 houses

Answer:



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32. As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their locality by planting a number of plants. They

involved the school kids and the local community in doing so.



Here is the data indicating the number of plants contributed by different houses:

Number of plants contributed	1-3	4-6	7-9	10-12	13-15	16-18
Number of houses	10	8	x	7	12	4

On the basis of the above information, answer any four of the following questions:

The mode of the frequency distribution is

A. 11.5

B. 12.65

C. 13.25

D. 13.65

Answer:



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33. As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their

locality by planting a number of plants. They involved the school kids and the local community in doing so.



Here is the data indicating the number of plants contributed by different houses:

Number of plants contributed	1-3	4-6	7-9	10-12	13-15	16-18
Number of houses	10	8	x	7	12	4

The median class of the frequency distribution is

A. 3.5-6.5

B. 6.5-9.5

C. 9.5-12.5

D. 12.5-15.5

Answer:



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34. Write the prime factorisation of 8190



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35. Form the quadratic polynomials whose zeroes are $3 + \sqrt{2}$, $3 - \sqrt{2}$



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36. If the point $P(6,2)$ divides the line segment joining $A(6,5)$ and $B(4, y)$ in the ratio $3:1$, then find the value of y .



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37. In a right triangle ABC, right-angled at B, if

$$\sin(A - C) = \frac{1}{2} \text{ find the measures of angles}$$

A and C



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38. If $\sin \theta = \frac{2mn}{m^2 + n^2}$, find the value of

$$\frac{\sin \theta \cot \theta}{\cos \theta}$$



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39. A die is thrown once. Find the probability of getting (A) a prime number greater than 3
(B) an even prime number greater than 3.



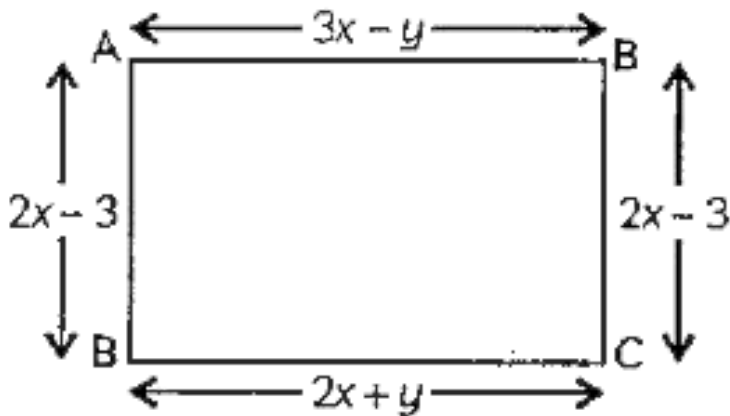
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40. Prove that $2\sqrt{3} - 4$ is an irrational number , using the fact that $\sqrt{3}$ is an irrational number .



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41. The figure shows a rectangle with its length and breadth as indicated.



Given that the perimeter of the rectangle is 120cm , find:

the values of x and y



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42. If $Q(0, 1)$ is equidistant from $P(5, -3)$ and $R(x, 6)$, find the values of x . Also, find the distances QR and PR .



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43. Draw a circle of radius 3 cm. Take a point P on the circle. At point P , construct a tangent to the circle.



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44. Prove that the area of the semicircle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the semicircles drawn on the other two sides of the triangle



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45. If the median of the distribution given below is 28.5, find the values of x and y .



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46. Which term of the AP : 3, 8, 13, 18, ..., is 78?



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47. P and Q are points on the sides CA and CB respectively of ABC , right angled at C .

Prove that $AQ^2 + BP^2 = AB^2 + PQ^2$.



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48. Find the number of places of decimal after which the decimal expansion of $\frac{232}{2^3 5^2}$ terminates.



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49. If α and β be the zeros of the polynomial $x^2 + x + 1$, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.



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50. In a right-angled triangle ABC, right angled at B, $AB = \frac{x}{2}$, $BC = x + 2$ and $AC = x + 3$. Find value of x .



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51. If k , $2k - 1$ and $2k + 1$ are three consecutive terms of an A.P., find the value of k .



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52. Determine the number of multiples of 4 that lie between 10 and 250.



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53. Find the roots of the equation

$$3x^2 + 2x = 0$$



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54. Check if $x = 2, y = 1$ is a solution of the system of equations:

$$3x - 2y = 4, 2x + y = 5$$



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55. Find the coordinates of the point which divides the line segment joining $A(-2, 2)$ and $B(2, 8)$ in the ratio $3 : 1$.



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56. State *SAS* similarity criterion.



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57. If in triangles ABC and PQR , $\frac{AB}{PQ} = \frac{AC}{RP}$ then write the equality of angles triangles of the two triangles such that two triangles are similar.



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58. Draw a line segment of length 8 cm and divides it in the ratio 2:3



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59. If $2 \cos 3\theta = \sqrt{3}$ ($0^\circ \leq \theta \leq 90^\circ$), then find the value of θ .



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60.

Evaluate

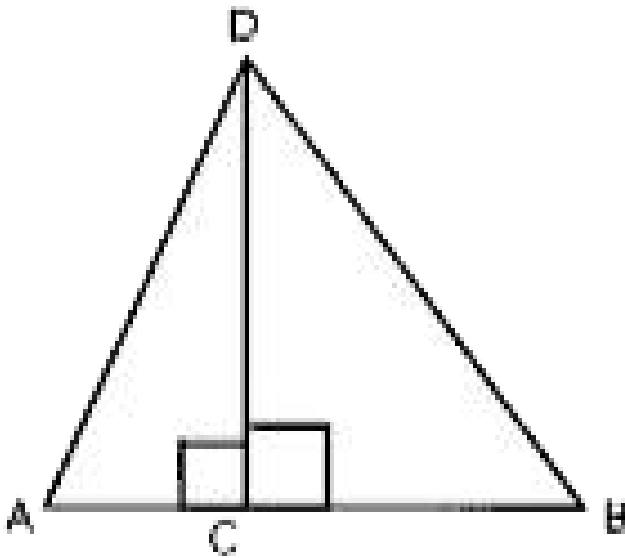
:

$$2 \sin^2 30^\circ \tan 60^\circ - 3 \cos^2 30^\circ \sec 60^\circ$$



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61. In the figure, $AC = 3$ cm, $BC = 6$ cm and $CD = 4$ cm. Write the value of (i) $\tan B$ (ii) $\cot A$



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62. Show that if the circumference of two circles are equal, then their areas are also equal.



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63. The area of a semicircle is 308cm^2 . Find its perimeter



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64. In a pack of 52 playing cards, what is the probability of a face card appearing if you pick a card?



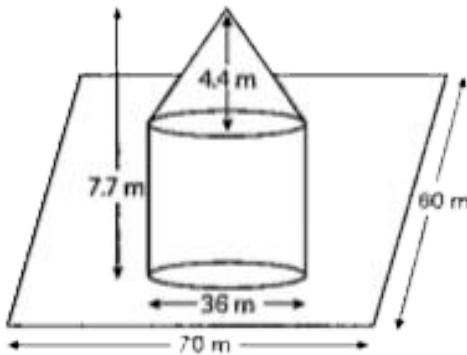
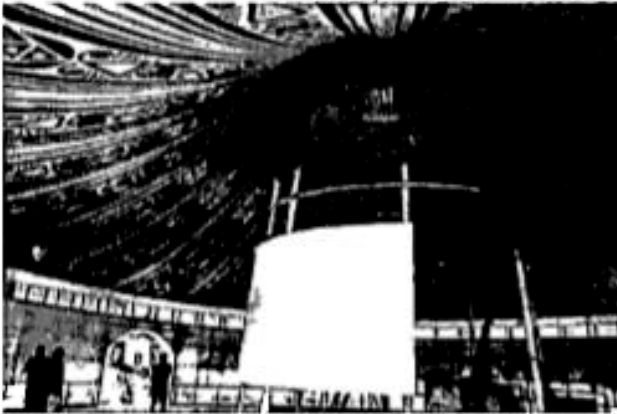
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65. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

Bholeram Tents is given a contract by the municipal corporation of Budaun (Uttar Pradesh), India to setup a mega function pandal (tent). The architect has designed a tent of height 7.7 m in the form of a right circular cylinder of diameter 36 m and height 4.4 m surmounted by a right circular cone. This tent is setup in a rectangular park of

dimensions 70 m \times 60 m as shown below.

The tent is made of canvas. (Take $\pi = 3.14$)



For the workers to finalise the purchase of material, the height of the conical part is:

A. 2.3 m

B. 6.3 m

C. 3.3 m

D. 12.1 m

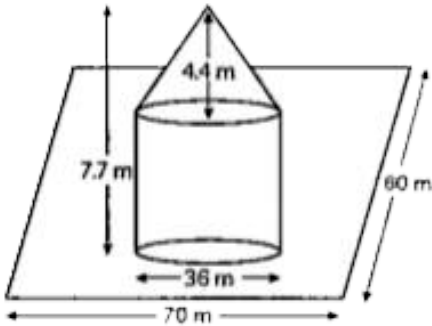
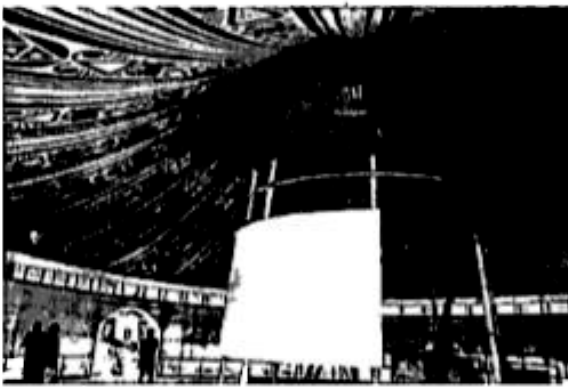
Answer:



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The slant height of the conical part is:

- A. 18.3 m
- B. 18.7 m
- C. 19.1 cm

D. 19.4 cm

Answer:

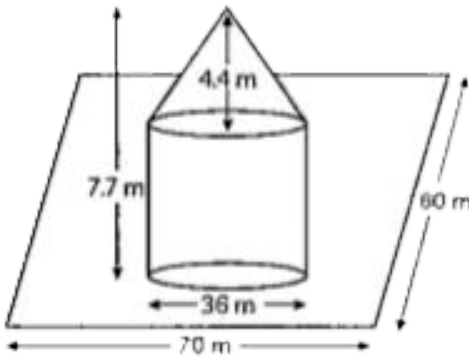
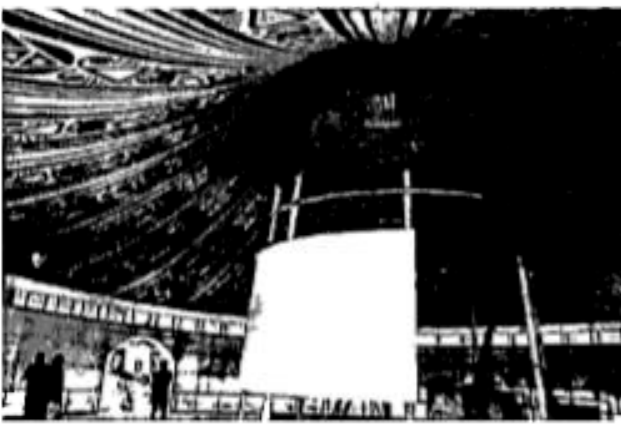


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Pradesh), India to setup a mega function pandal (tent). The architect has designed a tent of height 7.7 m in the form of a right circular cylinder of diameter 36 m and height 4.4 m surmounted by a right circular cone. This tent is setup in a rectangular park of dimensions 70 m \times 60 m as shown below. The tent is made of canvas. (Take $\pi = 3.14$)



To purchase the canvas, the area of the canvas to be used approx in making the tent, is:

- A. 1352 sq cm
- B. 1386 sq. m

C. 1406 sq m

D. 1533 sq m

Answer:

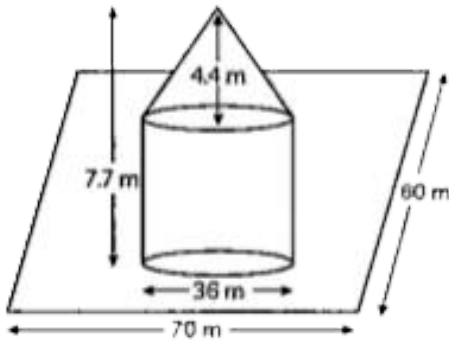
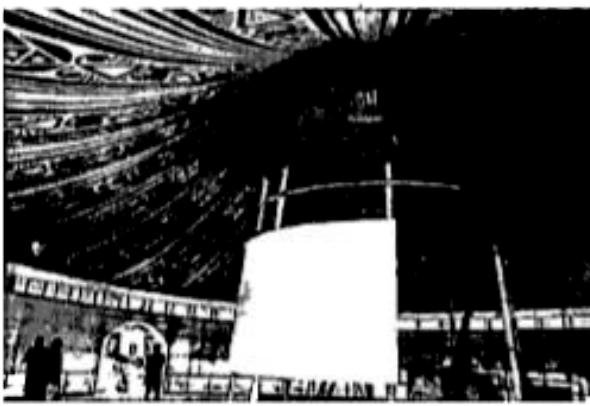


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Bholeram Tents is given a contract by the

municipal corporation of Budaun (Uttar Pradesh), India to setup a mega function pandal (tent). The architect has designed a tent of height 7.7 m in the form of a right circular cylinder of diameter 36 m and height 4.4 m surmounted by a right circular cone. This tent is setup in a rectangular park of dimensions 70 m \times 60 m as shown below. The tent is made of canvas. (Take $\pi = 3.14$)



The cost of canvas at ₹ 4.50, sq m is:

A. Rs. 6327

B. Rs. 6237

C. Rs. 6898.50

D. Rs. 6088.50

Answer:

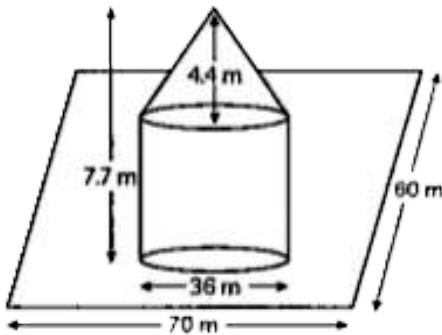
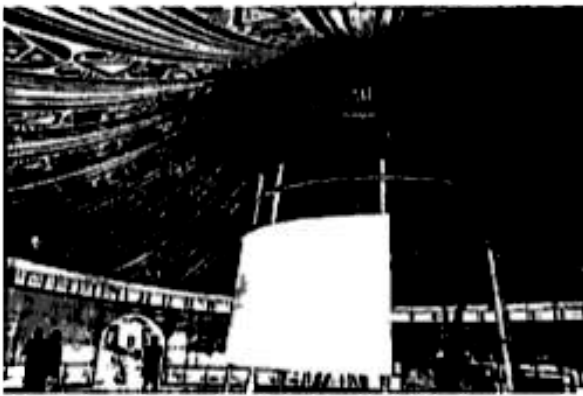


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The area of the rectangular park outside the tent is:

A. 1883 sq m

B. 2864 sq m

C. 3182 sq m

D. 4200 sq m

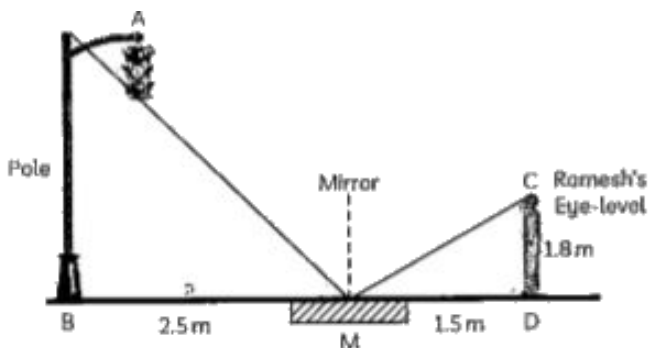
Answer:



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70. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fixed on it) (see the figure). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The

distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.



The two similar triangles shown in the figure are:

A. $\triangle ABM$, $\triangle MCD$

B. $\triangle AMB$, $\triangle CDM$

C. $\triangle ABM$, $\triangle CMD$

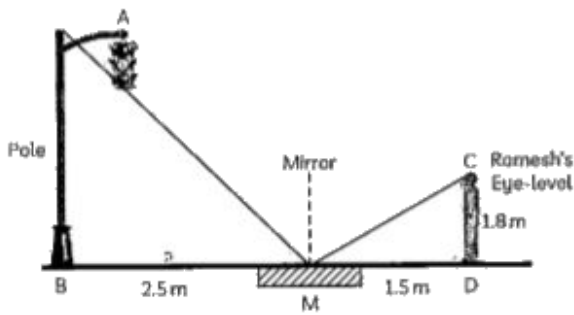
D. $\triangle ABM$, $\triangle MDC$

Answer:



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71. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it) (see the figure). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.



Which criterion of similarity is applicable to similar triangles?

A. SSA

B. ASA

C. SSS

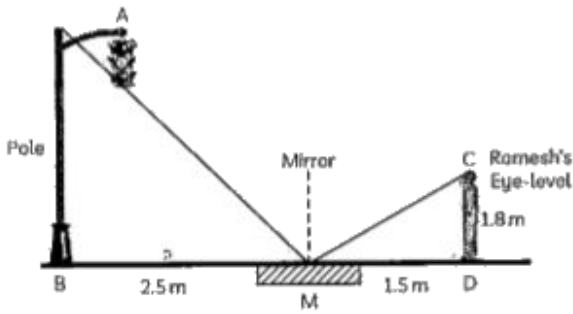
D. AAA

Answer:



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72. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fixed on it) (see the figure). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.



The height of the pole is:

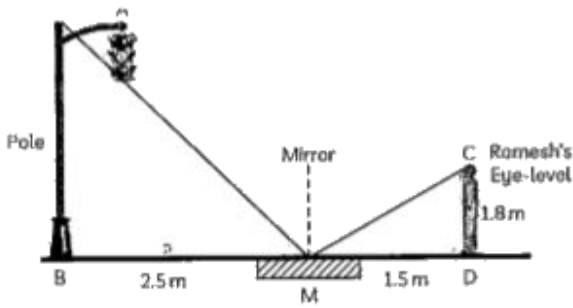
- A. 3 metres
- B. 2.8 metres
- C. 3.2 metres
- D. 3.8 metres

Answer:



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73. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fixed on it) (see the figure). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.



If Ramesh's eye level is 1.2 m above the ground, then the height of the pole is:

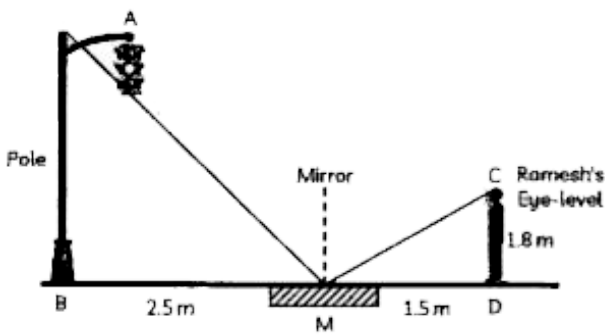
- A. 3 metres
- B. 2.6 metres
- C. 2.2 metres
- D. 2 metres

Answer:



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74. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fixed on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.



If the distance of Ramesh and the pole from the mirror are 2.5 m and 1.5 m respectively, then the height of the pole is:

- A. 3 metres
- B. 2.1 metres
- C. 1.8 metres
- D. 1.08 metres

Answer:

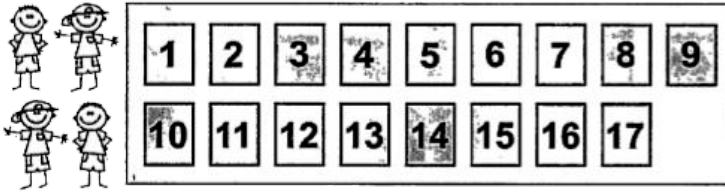


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75. 4 boys are having a night in and one of the boy's mother decides to play a game. 17 cards numbered 1, 2, 3_17 are put in a box and mixed thoroughly.

The mother asks each boy to draw a card and after each draw, the card is replaced back in the box. She shows some magic tricks and at the end, decides to test their mathematical

skills.



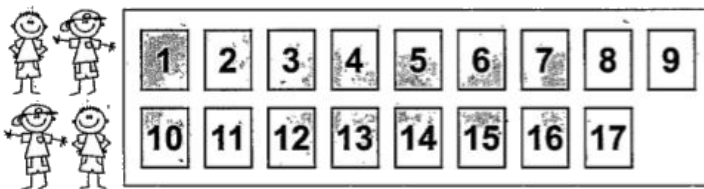
The probability of drawing an odd number card in the first draw by the first boy is:

- A. $\frac{11}{17}$
- B. $\frac{10}{17}$
- C. $\frac{9}{17}$
- D. $\frac{8}{17}$

Answer:



76. 4 boys are having a night in and one of the boy's mother decides to play a game. 17 cards numbered 1, 2, 3 . 17 are put in a box and mixed thoroughly. The mother asks each boy to draw a card and after each draw, the card is replaced back in the box. She shows some magic tricks and at the end, decides to test their mathematical skills.



The probability of drawing a prime number card in the second draw by the second boy is

A. $\frac{3}{16}$

B. $\frac{7}{17}$

C. $\frac{9}{17}$

D. 8.15

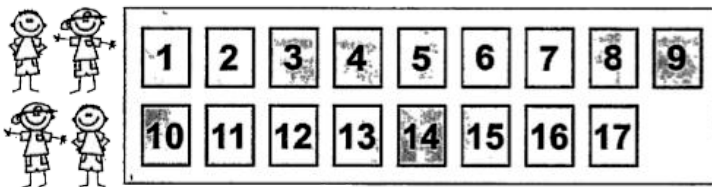
Answer:



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77. 4 boys are having a night in and one of the boy's mother decides to play a game. 17 cards numbered 1, 2, 3_17 are put in a box and mixed thoroughly.

The mother asks each boy to draw a card and after each draw, the card is replaced back in the box. She shows some magic tricks and at the end, decides to test their mathematical skills.



If the card is not replaced after the second

draw, the probability of drawing a card bearing a multiple of 3 greater than 4 in the third draw by the third boy is:

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

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

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

D. $\frac{5}{6}$

Answer:



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78. $\frac{x - 2}{x - 3} + \frac{x - 4}{x - 5} = \frac{10}{3}; x \neq 3, 5$



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79. Using prime factorisation, find HCF and LCM of 18, 45 and 60.



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80. If the points $A(1, -2)$, $B(2, 3)$, $C(a, 2)$ and $D(-4, -3)$ forms a parallelogram, find the value of 'a'.



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81. Taking $A = 30^\circ$, verify the following:

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$



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82. Find the solution of the pair of equations:

$$x - y + 1 = 0, 3x + 2y - 12 = 0$$



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83. Point P divides the line segment joining the points $A(2, 1)$ and $B(5, -8)$ such that $\frac{AP}{AB} = \frac{1}{3}$. If P lies on the line $2x - y + k = 0$, find the value of k.



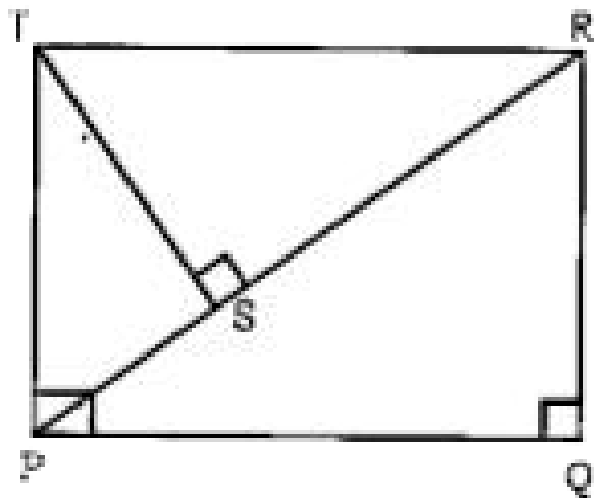
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84. Theorem 6.8 : In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.



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85. In the figure, $RQ \perp PQ$, $PQ \perp PT$ and $ST \perp PR$. Prove that: $ST \times QR = PS \times PQ$



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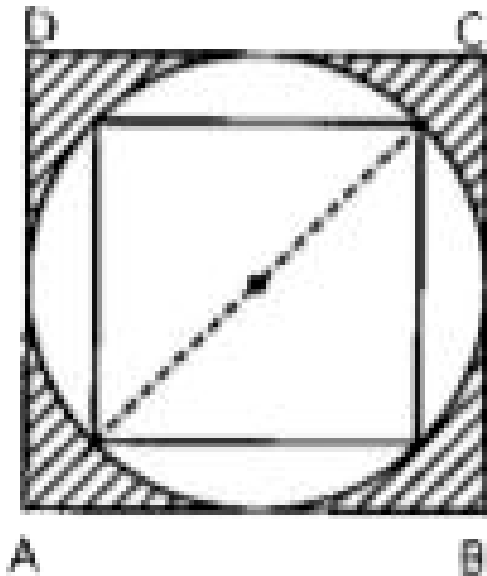
86. Prove that

$$\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = 2 \operatorname{cosec} \theta$$



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87. A circle is inscribed in a square of side 4 cm. Determine the left out area. What will be the left out area of the circle if a square is inscribed in the circle? (Use $\pi = 3.14$)





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88. The lengths of 40 leaves of a plant are measured correct to the nearest millimetre, and the data obtained is represented in the following table : Find the median length of the leaves. (Hint: The data needs to be converted to continuous classes for



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89. The sum of the ages of father and his son is 45 years . 5 years ago the products of their ages was 124. Find the present ages .



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90. A vertical tower stands on a horizontal plane and is surmounted by a vertical flag staff of height h . At a point on the plane, the angles of elevation of the bottom and the top of the flag.





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91. Type V: O is the center of the circle of radius 5cm . T is a point such that $OT=13\text{cm}$ and OT intersects the circle at E . If AB is the tangent to the circle at E ; find the length of AB .



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92. If two sides and a median bisecting one of these sides of a triangle are respectively

proportional to the two sides and corresponding median of another triangle; then triangle are similar.



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