



MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 5

Section A

1. If $(1 - p)$ is a zero of the polynomial $x^2 + px + 1 - p = 0$, then find both zeroes of the polynomial.

A. 0, - 1

B. 1, - 1

C. 1,0

D. 0,0

Answer: A



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2. How many solution does the pair of equations $x + y = 1$ and $x + y = -5$ have?

- A. Unique
- B. No Solution
- C. Infinitely many
- D. Can't decide

Answer: B



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3. Which of the following is wrong in case of representation of probability in percentage

- A. Less than 100

B. Less than 0

C. Less than 1

D. Equal to 0

Answer: B



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4. If $4^{x+y} = 256$ and $(256)^{x-y} = 4$. what are the values of x and y ?

A. $\left(\frac{1}{8}, \frac{17}{18}\right)$

B. $\left(\frac{13}{8}, \frac{15}{8}\right)$

C. $\left(\frac{17}{8}, \frac{15}{8}\right)$

D. $\left(\frac{13}{8}, \frac{11}{8}\right)$

Answer: C



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5. The perimeter of a triangle with vertices (0,4),(0,0) and (3,0) is

A. 10 units

B. 15 units

C. 12 units

D. 9 units

Answer: C



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6. If $\operatorname{cosec} A = 2$, then $\frac{1}{\tan A} + \frac{\sin A}{1 + \cos A} = ?$

A. 2

B. 0

C. 1

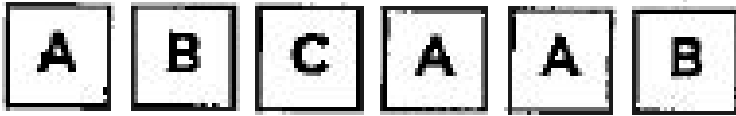
D. -1

Answer: A



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7. A child has a die whose 6 face show, the letters given below.



If the die is thrown once, what is the probability of getting B?

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

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

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

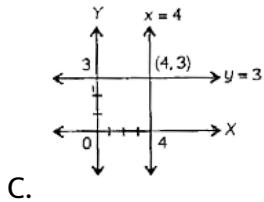
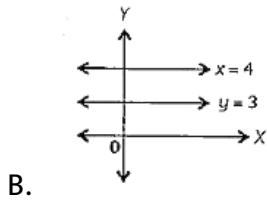
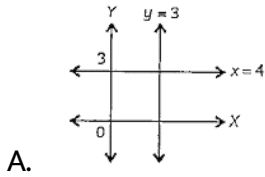
D. $\frac{1}{5}$

Answer: C



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8. Show the graphical representation of given pair of linear equations $x = 4$ and $y = 3$.



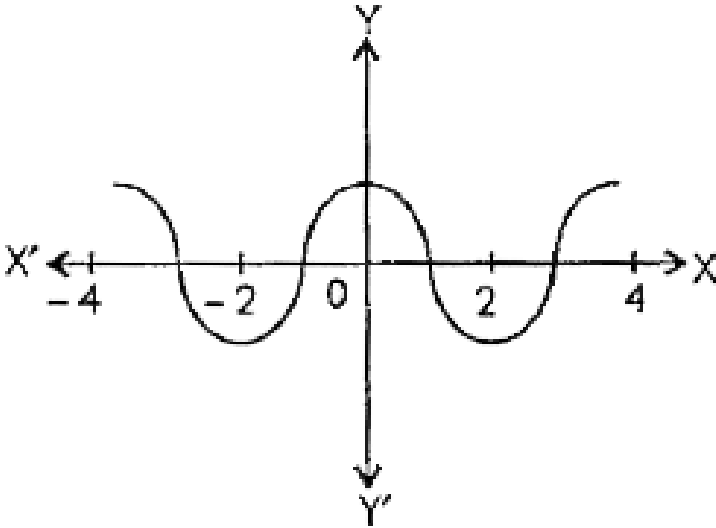
D. None of these

Answer: C



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9. Calculate the number of zeroes lying between -2 to 2 of the polynomial $f(x)$, whose graph is shown below.

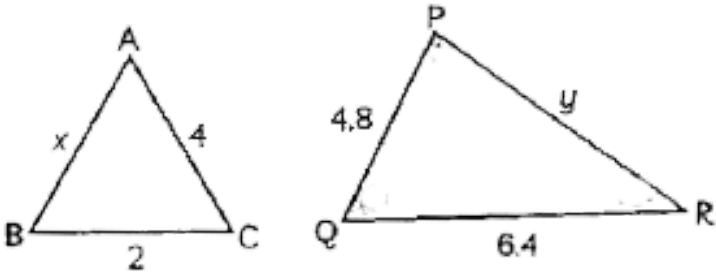


- A. 3
- B. 4
- C. 2
- D. 1

Answer: C

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10. What is value of $x + y$, if $\triangle ABC$ and $\triangle PQR$ are similar?



- A. 12.8 cm
- B. 14.3 cm
- C. 12.5 cm
- D. 14 cm

Answer: B



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11. Find the value(s) of k , if one of the zeroes of the polynomial

$f(x) = (k^2 + 8)x^2 + 13x + 6k$ is reciprocal of the other.

A. 2, 4

B. 3, 5

C. 1, 3

D. -1, 1

Answer: A



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12. A circle, has its centre at $(-1, 3)$. If one end of a diameter of the circle has co-ordinates $(2,5)$, then find the co-ordinates of the other end of the diameter.

A. $(-4,1)$

B. $(1,8)$

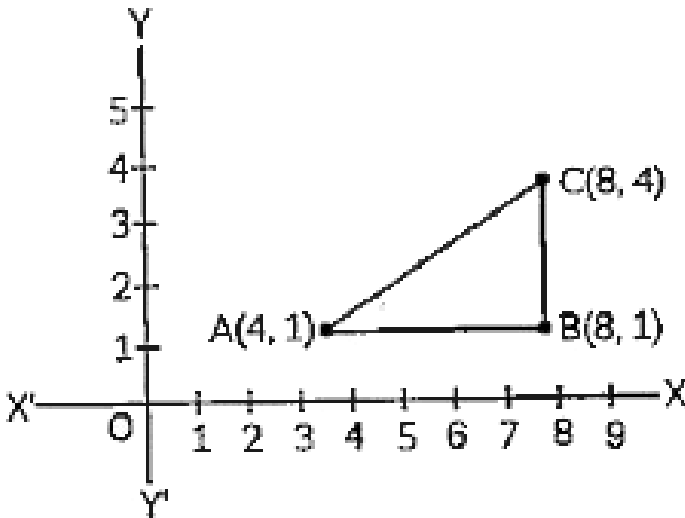
C. $(0.5, 4)$

D. $(-1,4)$

Answer: A

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13. A boy school is standing on the school's ground at a point A having coordinates (4, 1) facing towards east. He moves 4 units in the straight line then take right and moves 3 units and stop, then he reaches his home Representation of the above situation on the coordinate axes is shown below.



What is the shortest distance between his school and house?

A. 7 units

B. 3 units

C. 5 units

D. 4 units

Answer: C



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14. Find the probability of getting the same number of two dice in a single throw of two dice.

A. $\frac{1}{36}$

B. $\frac{5}{36}$

C. $\frac{7}{36}$

D. $\frac{11}{36}$

Answer: C



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15. In the equation shown below, a and b are unknown constants.

$$3ax + 4y = -2 \text{ and } 2x + by = 14$$

If $(-3, 4)$ is the solution of the given equations, find the value of a,b.

A. 10

B. 6

C. 12

D. 15

Answer: A



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16. What are the coordinates of the centroid of the triangle having vertices as (a, b) , $(b, b-a)$ and $(c, a - b)$?

A. $(1, 1)$

B. $\left(\frac{a + b + c}{3}, 0\right)$

C. $(0, 0)$

D. $\left(0, \frac{b}{3}\right)$

Answer: B



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17. Find the positive minimum value of $\sec \theta$?

A. 0

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

C. 1

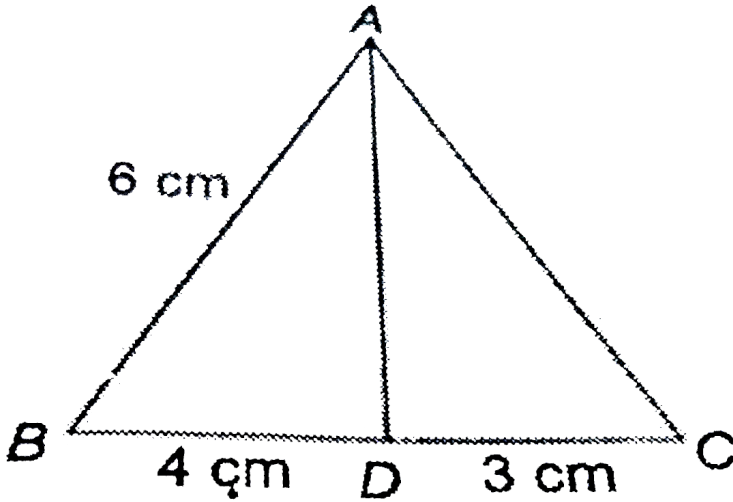
D. 2

Answer: C



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18. In the given figure AD is the bisector of $\angle A$. If $BD = 4$ cm , $DC = 3$ cm and $AB = 6$ cm . Find AC.



- A. 4.5 cm
- B. 6 cm
- C. 3 cm
- D. 7 cm

Answer: A



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19. What is the distance of the point P(3, -4) from the origin?

A. 3 units

B. 4 units

C. 5 units

D. 7 units

Answer: C



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20. Evaluate $\left(\frac{-101}{\cos^2 A} + \frac{101}{\cot^2 A} \right)$

A. 101

B. -101

C. 1

D. -1

Answer: B



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Section B

1. The point P which divides the line segment joining the points A(2, 5) and B(5, 2) in the ratio 2 : 3 lies in the quadrant

A. I

B. II

C. III

D. IV

Answer: A



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2. Evaluate the zeroes of the polynomial $2x^2 - 16$?

A. $2\sqrt{2}, -2\sqrt{2}$

B. $\sqrt{2}, -\sqrt{2}$

C. $4, -4$

D. $2, -2$

Answer: A



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3. Find a rational number between $\sqrt{2}$ and $\sqrt{3}$.

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

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

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

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

Answer: D



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4. If we draw $x = a$ and $y = b$ graphically, then these two lines will intersect at:

- A. (a, b)
- B. $(a, 0)$
- C. $(0, b)$
- D. $(-a, -b)$

Answer: A



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5. Find the largest number which divides 615 and 963 leaving remainder 6 in each case.

A. 87

B. 75

C. 56

D. 88

Answer: A



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6. What is the simplified form of $\cos^4 \theta - \sin^4 \theta$ in terms of $\sin \theta$

A. $1 - 2 \sin^2 \theta$

B. $2 \sin^2 \theta + 1$

C. $\sin^2 \theta + 1$

D. $\sin^2 \theta + 2$

Answer: A



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7. If α and β are the zeroes of $x^2 - 8x + 1$, then the value of

$$\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta \text{ is :}$$

A. 7

B. 1

C. 5

D. -8

Answer: A



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8. What are the co-ordinates of the point which lies 8 units below origin

A. (0,8)

B. (0, -8)

C. (-8, 0)

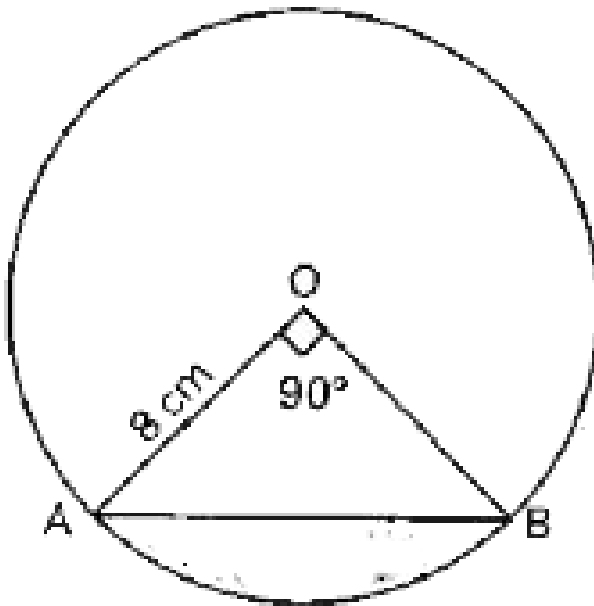
D. (8,0)

Answer: B



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9. Shaurya is making a greeting card for the father's day. In the card, the shaded part is folded . What is the area of the region folder in the greeting card ?



A. $16(\pi - 2)cm^2$

B. $8(\pi^2 - 2)cm^2$

C. $16\pi cm^2$

D. $\frac{7\pi}{2}cm^2$

Answer: A



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10. Evaluate : $5 + \frac{(1 + \tan^2 \theta) \sin \theta \cos \theta}{\tan \theta}$

A. 1

B. 5

C. -1

D. 6

Answer: D



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11. Find the value of 'p' if the distance between the points (4, p) and (1, 0) is 5 units.

- A. +4
- B. +6
- C. +8
- D. +7

Answer: A



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12. How many zeroes will be there for the polynomial

$$f(x) = (x - 2)^2 + 4?$$

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

D. 3

Answer: A



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13. If we add 1 to the numerator and subtract 1 from the denominator, a fraction becomes 1. It also becomes $\frac{1}{2}$ if we only add 1 to the denominator. What is the fraction?

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

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

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

D. $\frac{4}{5}$

Answer: C



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14. If $p(x) = ax^2 + bx + c$, then $-\frac{b}{a}$ is equal to

A. 0

B. 1

C. product of zeroes

D. sum of zeroes

Answer: D



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15. What is the value of $m^2 - n^2$, where $m = \tan \theta + \sin \theta$ and $n = \tan \theta - \sin \theta$?

A. $\sqrt{\frac{m}{n}}$

B. $4\sqrt{mn}$

C. \sqrt{mn}

D. $\sqrt{\frac{4}{mn}}$

Answer: B



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16. What is the area swept by a minute hand of a clock in 10 minutes, if the length of minute hand is 15 cm?

A. $\frac{\pi}{7}cm^2$

B. $32\pi cm^2$

C. $\frac{75}{2}\pi cm^2$

D. $75\pi cm^2$

Answer: C



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17. A game consists of tossing a one rupee coin 3 times and noting its outcome each time. Hanif wins if all the tosses give the same result i.e.

three heads or three tails, and loses otherwise. Calculate the probability that Hanif will lose the game.

A. 0

B. 1

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

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

Answer: C



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18. Find the value of k for which the linear equations $x + 2y = 3$ and $5x + ky = 7$, does not has a unique solution.

A. 5

B. 7

C. 2

D. 10

Answer: D



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19. A number is selected from the numbers 1, 2 15. What is the probability that it is a multiple of 4?

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

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

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

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

Answer: C



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

A. $\sqrt{2} : \pi$

B. $\sqrt{3} : \pi$

C. $\pi : \sqrt{3}$

D. $\pi : \sqrt{2}$

Answer: C



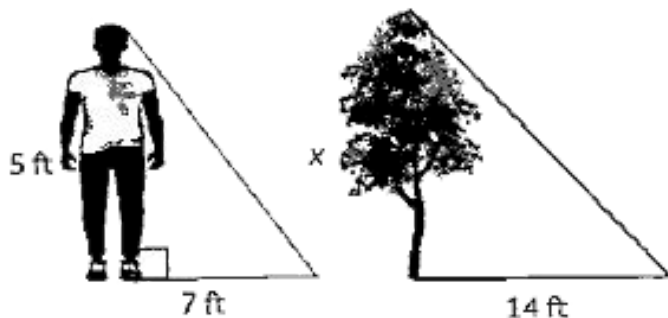
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Section C

1. Magnification of figures is a process of enlarging the apparent size, not the physical size, of something. The enlarged figure is quantified by a calculated number. If two triangles are similar then their corresponding sides are in the same ratio. Basically a bigger triangle is an enlargement of

the smaller triangle. This basic rule of similar triangles is applicable in solving many real life problems like relating the height and shadow length of various objects at a particular instant in a day.

Evaluate x , by considering the figure below.



- A. 12 ft
- B. 15 ft
- C. 10 ft
- D. 7 ft

Answer: C

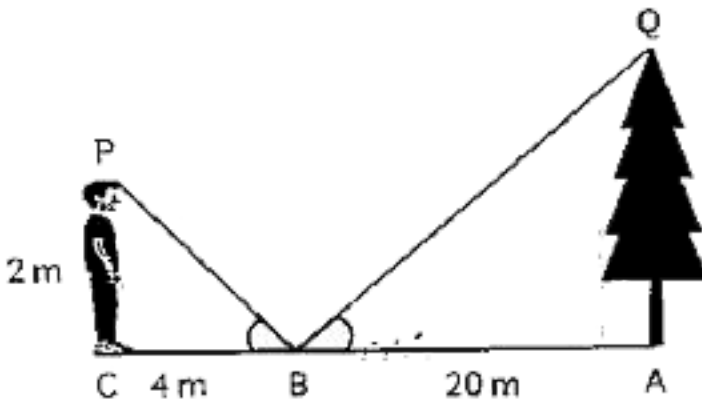


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2. Magnification of figures is a process of enlarging the apparent size, not the physical size, of something. The enlarged figure is quantified by a calculated number. If two triangles are similar then their corresponding sides are in the same ratio. Basically a bigger triangle is an enlargement of the smaller triangle. This basic rule of similar triangles is applicable in solving many real life problems like relating the height and shadow length of various objects at a particular instant in a day.

See the figure below and evaluate the height of the tree.

If the shadows of a lamp-post and a tree at the same time of a day are 18 ft. and 6 ft. respectively then what is the height of the lamp-post.



A. 25 m

B. 40 m

C. 20 m

D. 10 m

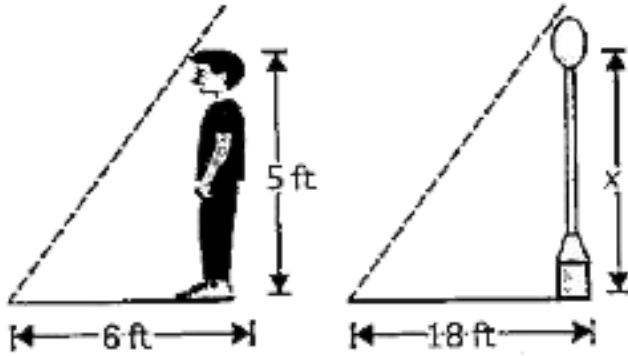
Answer: D



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3. Magnification of figures is a process of enlarging the apparent size, not the physical size, of something. The enlarged figure is quantified by a calculated number. If two triangles are similar then their corresponding sides are in the same ratio. Basically a bigger triangle is an enlargement of the smaller triangle. This basic rule of similar triangles is applicable in solving many real life problems like relating the height and shadow length of various objects at a particular instant in a day.

Evaluate x , by considering the figure below.



- A. 15 ft
- B. 10 ft
- C. 12 ft
- D. 18 ft

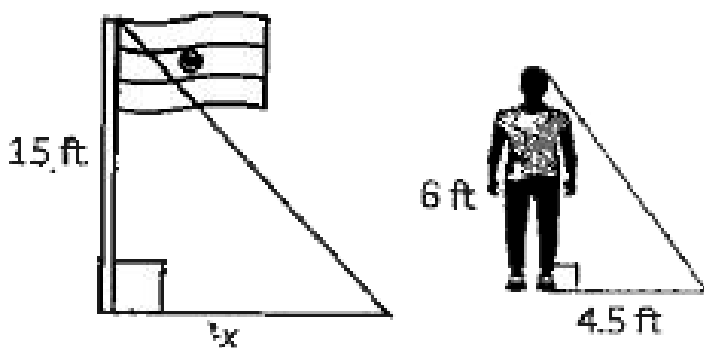
Answer: A

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4. Magnification of figures is a process of enlarging the apparent size, not the physical size, of something. The enlarged figure is quantified by a

calculated number. If two triangles are similar then their corresponding sides are in the same ratio. Basically a bigger triangle is an enlargement of the smaller triangle. This basic rule of similar triangles is applicable in solving many real life problems like relating the height and shadow length of various objects at a particular instant in a day.

Evaluate for x



- A. 10.5 ft
- B. 11.25 ft
- C. 12 ft
- D. 9 ft

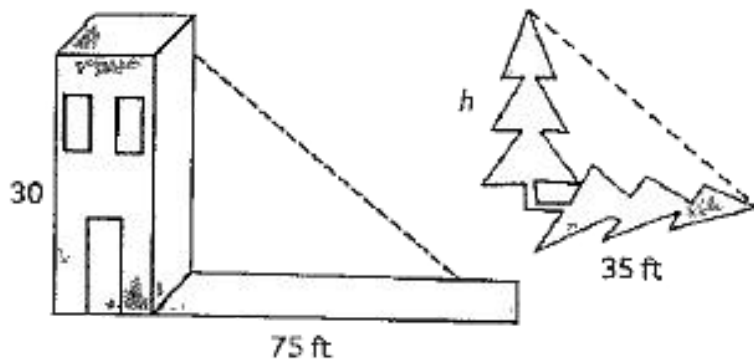
Answer: B



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5. Magnification of figures is a process of enlarging the apparent size, not the physical size, of something. The enlarged figure is quantified by a calculated number. If two triangles are similar then their corresponding sides are in the same ratio. Basically a bigger triangle is an enlargement of the smaller triangle. This basic rule of similar triangles is applicable in solving many real life problems like relating the height and shadow length of various objects at a particular instant in a day.

What is the height of the tree i.e. h ?



A. 20 ft

B. 12 ft

C. 18 ft

D. 14 ft

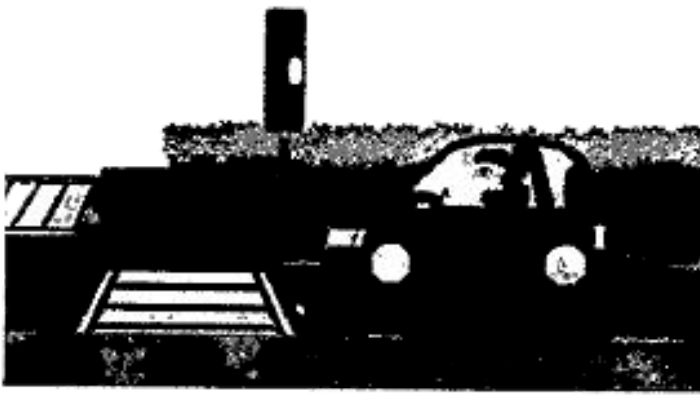
Answer: D



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6. When we pass from crossing on a road we all see traffic lights blinking there. A traffic controller set the timings of traffic lights in such a way that all lights are not green at the same time or specially not in the rush hour, because it can create chaos or problems. So, he take the timings of nearby places in same area and calculate LCM of all traffic stops and he easily manage the traffic by increase the duration or set at different times.

There are two traffic lights on a particular highway which shows green light on time of 90 seconds and 144 seconds respectively.



Evaluate the HCF of the timings of two green Lights.

- A. 21
- B. 18
- C. 17
- D. 22

Answer: B



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7. When we pass from crossing on a road we all see traffic lights blinking there. A traffic controller set the timings of traffic lights in such a way

that all lights are not green at the same time or specially not in the rush hour, because it can create chaos or problems. So, he take the timings of nearby places in same area and calculate LCM of all traffic stops and he easily manage the traffic by increase the duration or set at different times.

There are two traffic lights on a particular highway which shows green light on time of 90 seconds and 144 seconds respectively.

Calculate their LCM.

A. 720

B. 750

C. 725

D. 700

Answer: A



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8. Factor tree of a number helps in calculating

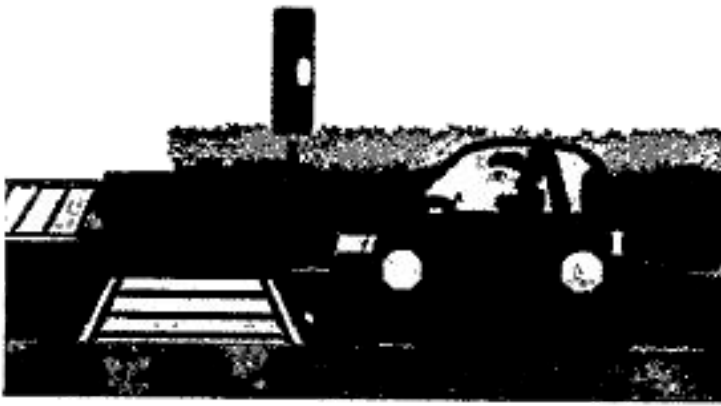
- A. prime factors
- B. HCF
- C. LCM
- D. Both (a) and (b)

Answer: A

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9. When we pass from crossing on a road we all see traffic lights blinking there. A traffic controller set the timings of traffic lights in such a way that all lights are not green at the same time or specially not in the rush hour, because it can create chaos or problems. So, he take the timings of nearby places in same area and calculate LCM of all traffic stops and he easily manage the traffic by increase the duration or set at different times.

There are two traffic lights on a particular highway which shows green light on time of 90 seconds and 144 seconds respectively.



Which of the following relation is correct?

A. $\text{HCF}(a, b) \times \text{LCM}(a, b) = \frac{a}{b}$?

B. $\frac{\text{HCF}(a, b)}{\text{LCM}(a, b)} = \frac{a}{b}$

C. $\text{HCF}(a, b) \times \text{LCM}(a, b) = a - b$

D. $\text{HCF}(a, b) \times \text{LCM}(a, b) = ab$

Answer: D



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10. Two numbers which do not have any factor common other than 1 are called:

A. Rational numbers

B. co-prime numbers

C. prime numbers

D. both (a) and (c)

Answer: B



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Part A Section I

1. Find the number of places of decimal after which the decimal expansion

of $\frac{232}{2^3 5^2}$ terminates.



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2. 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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3. 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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4. If k , $2k - 1$ and $2k + 1$ are three consecutive terms of an A.P., find the value of k .



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



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6. Find the roots of the equation $3x^2 + 2x = 0$

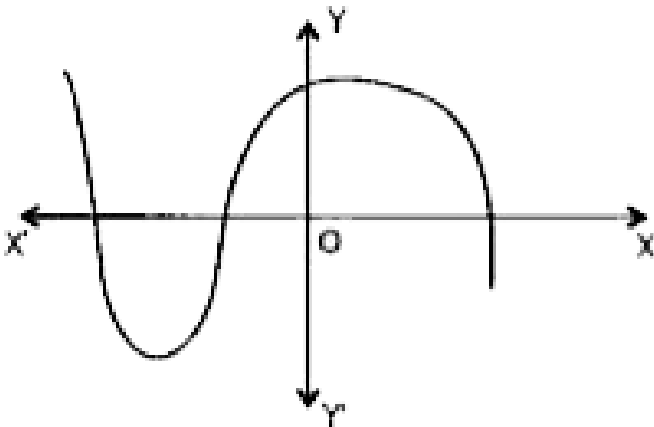
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7. Check if $x = 2, y = 1$ is a solution of the system of equations:

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

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8. How many zeros are there of the polynomial whose graph is shown below?



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9. 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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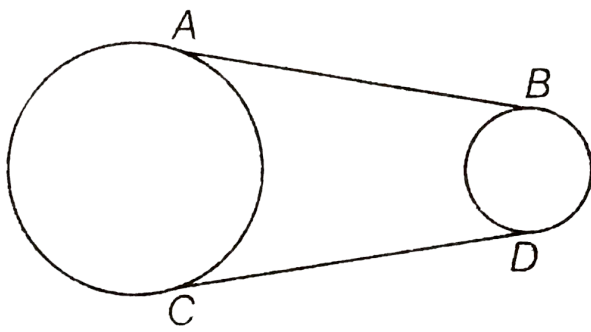
10. State *SAS* similarity criterion.

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11. If in two $\triangle ABC$ and $\triangle PQR$, $\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then

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12. In figure, AB and CD are common tangents to two circles of unequal radii. Prove that AB=CD



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

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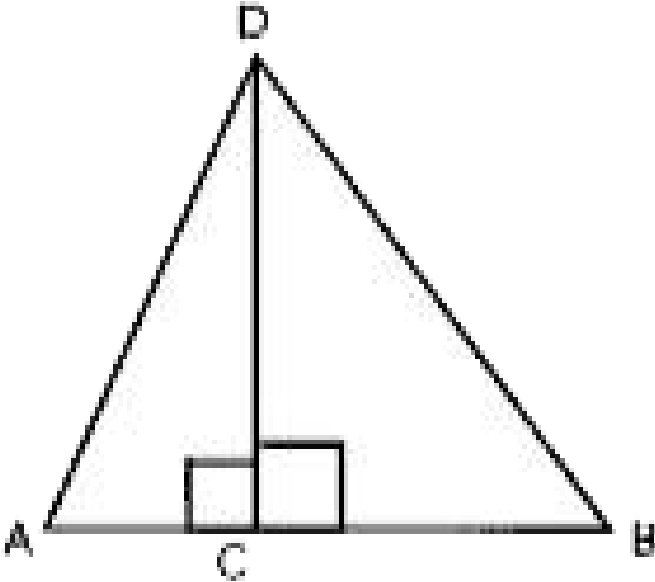
14. If $2 \cos 3\theta = \sqrt{3}$ ($0^\circ \leq \theta \leq 90^\circ$), then find the value of θ .

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15. Evaluate : $2 \sin^2 30^\circ \tan 60^\circ - 3 \cos^2 30^\circ \sec 60^\circ$

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16. 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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17. Show that if the circumferences of two circles are equal, then their areas are also equal.

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18. If the area of a semi-circle is 308 cm^2 , then find its radius (in cm).

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19. 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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20. Find the mean of the following distribution:

x	10	30	50	70	90
f	7	5	10	3	5

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21. The median from the following distribution is

Class:	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 –
Frequency:	5	6	15	10	5	4	2

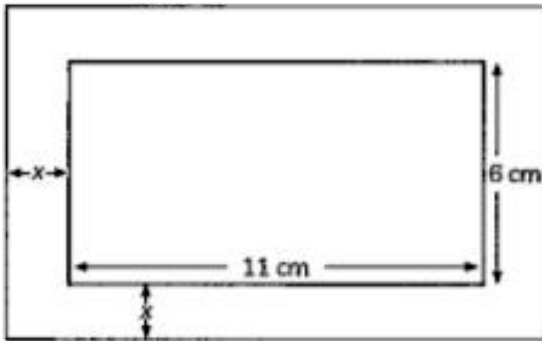
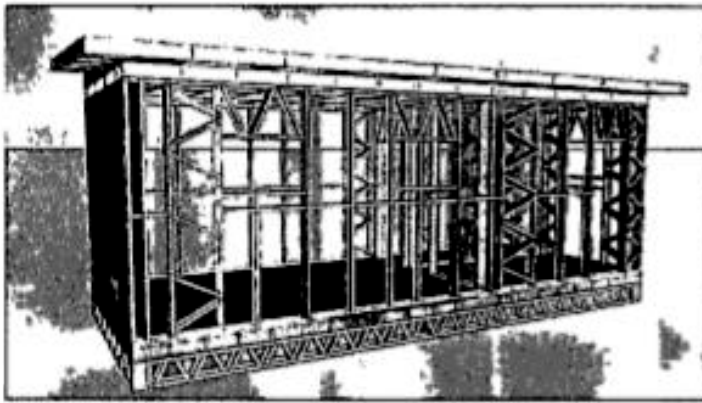
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Part A Section II

1. Tata Steels is going to make frames as part of a new warehouse they are setting up for amazon fulfilment projects. To manage detailing, fabrication and construction of steel framing projects can be challenging. For which, they are using a 3D CAD software to create a constructible model that includes the relevant information such as dimensions of the warehouse and material needed.

The frame will have a solid base and will be cut out of a piece of steel, and to keep the weight down, the final area of the frame should be 28 sq cm.

In order to input the right values in the CAD software, the engineer need to calculate some basic things.



If the width of the frame is ' x ' cm, then the dimensions of the outer frame are:

- A. $(11 + x)$ and $(6 + x)$
- B. $(11 - x)$ and $(6 - x)$
- C. $(11 + 2x)$ and $(6 + 2x)$
- D. $(11 - 2x)$ and $(6 - 2x)$

Answer: C

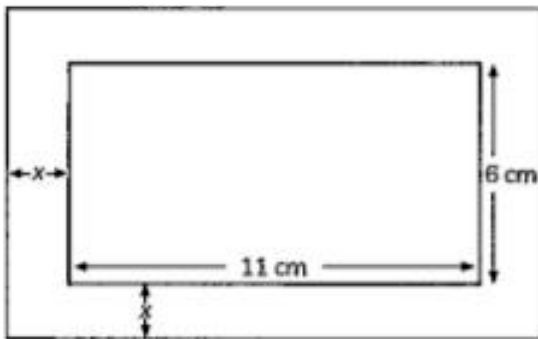
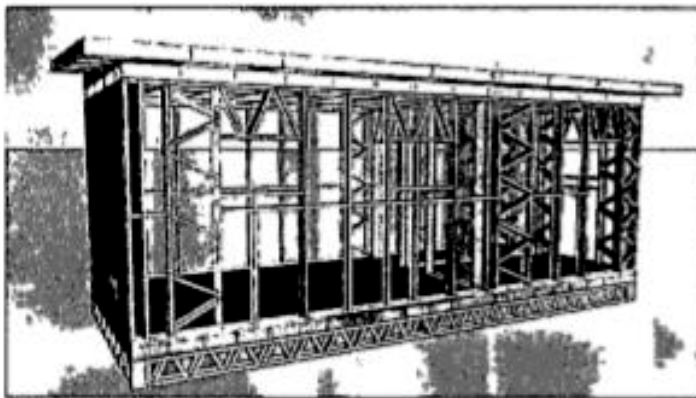


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2. Tata Steels is going to make frames as part of a new warehouse they are setting up for amazon fulfilment projects. To manage detailing, fabrication and construction of steel framing projects can be challenging. For which, they are using a 3D CAD software to create a constructible model that includes the relevant information such as dimensions of the warehouse and material needed.

The frame will have a solid base and will be cut out of a piece of steel, and to keep the weight down, the final area of the frame should be 28 sq cm.

In order to input the right values in the CAD software, the engineer need to calculate some basic things.



Area of the metal sheet (in sq cm) before cutting is.

- A. $4x^2 + 34x + 66$
- B. $x^2 + 17x + 66$
- C. $5x^2 + 30$
- D. $10(x^2 + 15x + 4)$

Answer: A

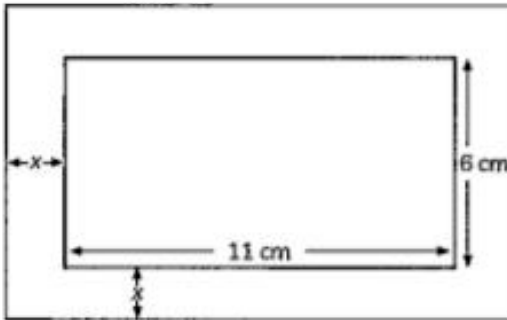
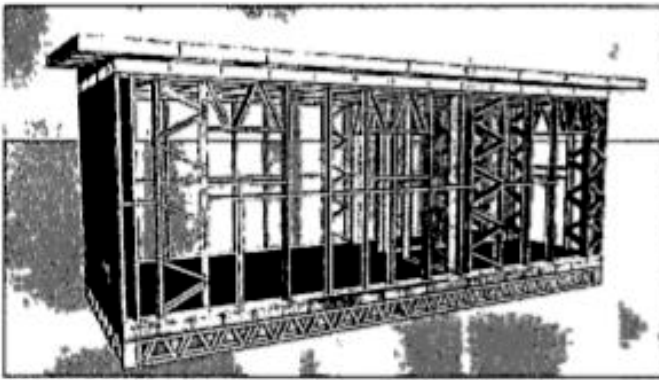


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3. Tata Steels is going to make frames as part of a new warehouse they are setting up for amazon fulfilment projects. To manage detailing, fabrication and construction of steel framing projects can be challenging. For which, they are using a 3D CAD software to create a constructible model that includes the relevant information such as dimensions of the warehouse and material needed.

The frame will have a solid base and will be cut out of a piece of steel, and to keep the weight down, the final area of the frame should be 28 sq cm.

In order to input the right values in the CAD software, the engineer need to calculate some basic things.



Area of metal sheet (in sq cm) after cutting out the $11 \text{ cm} \times 6 \text{ cm}$ inside, is:

- A. $x^2 + 17x$
- B. $12x^2 + 51$
- C. $4x^2 + 30$
- D. $4x^2 + 34x$

Answer: D



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4. Which of the following statements are true or false?

(a) Geeta wants to raise a boundary wall around her house. For this, she must find the area of the land of her house.

(b) A person preparing a track to conduct sports must find the perimeter of the sports ground.



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5. The area of a frame is 160cm^2 and its length is 16cm . Then the perimeter of the frame is:



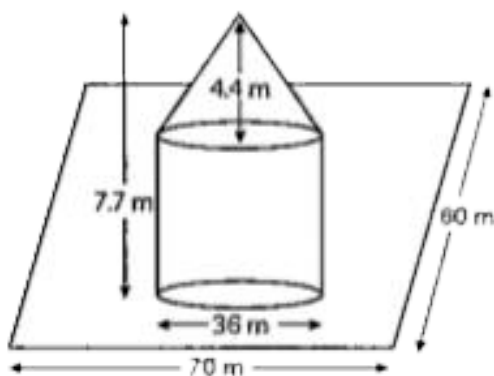
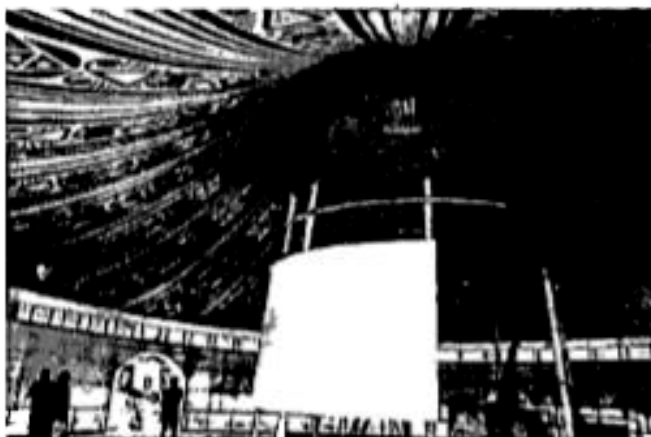
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6. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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. 3.3m

D. 12.1 m

Answer: C

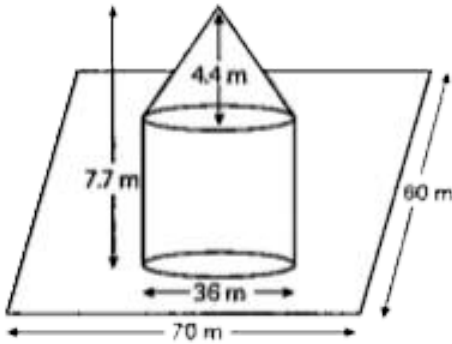
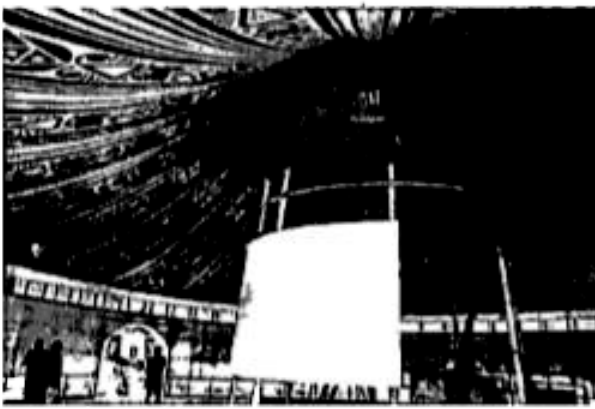


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7. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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 $\pi = 3.14$)



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: A

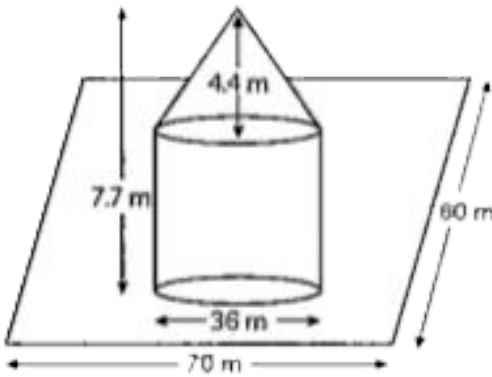
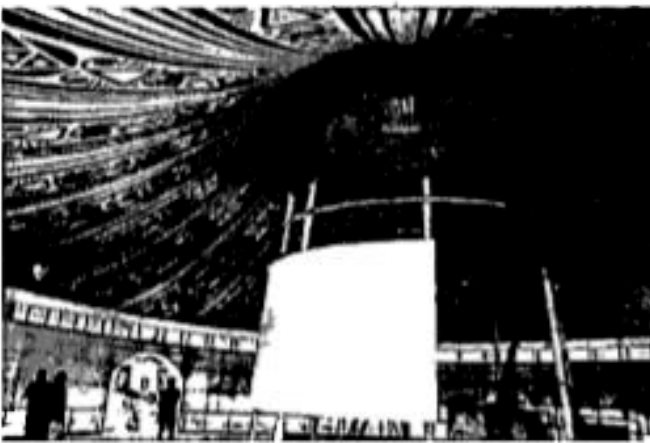


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8. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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 $\pi = 3.14$)



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

- A. 1353 sq cm
- B. 1386 sq m
- C. 1406 sq m
- D. 1533 sq m

Answer: D

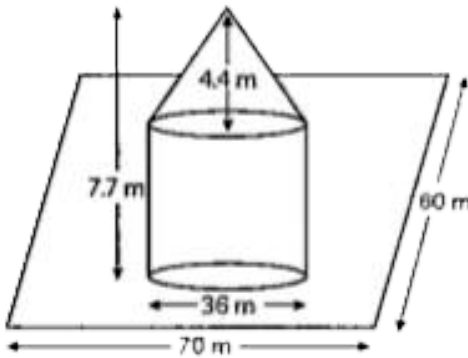
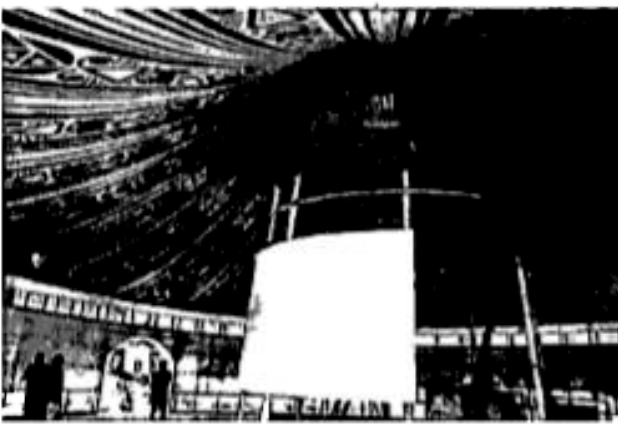


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9. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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 $\pi = 3.14$)



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

- A. ₹ 6327
- B. ₹ 6237
- C. ₹ 6898.50
- D. ₹ 6088.50

Answer: C

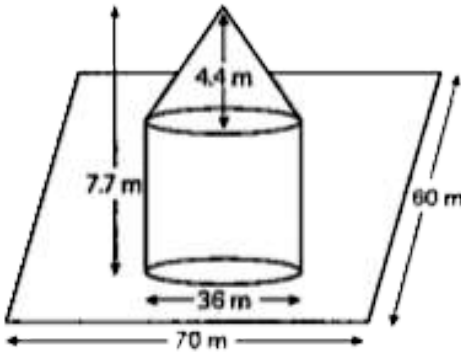
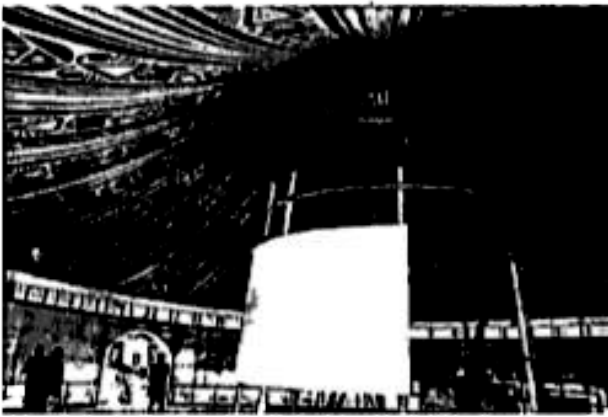




10. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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 $\pi = 3.14$)



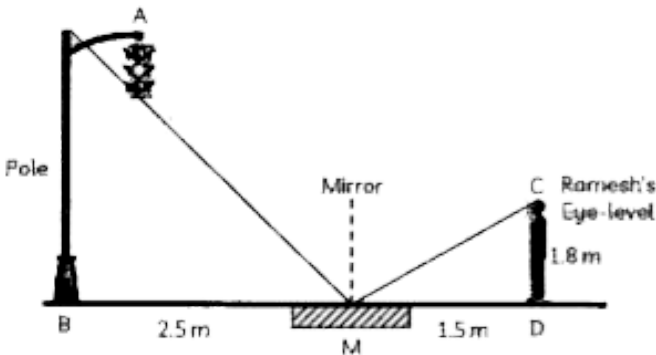
The area of the rectangular park outside the tent is:

- A. 1883 sq m
- B. 2864 sq m
- C. 3182 sq m
- D. 4200 sq m

Answer: C



11. 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.



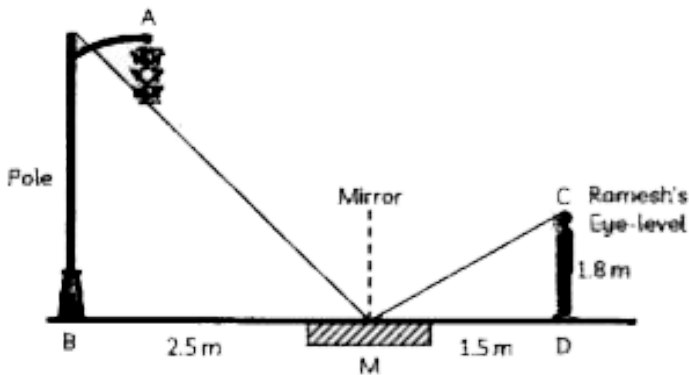
The two similar triangles shown in the figure are:

- A. $\triangle ABM, \triangle MCD$
- B. $\triangle AMB, \triangle CMD$
- C. $\triangle ABM, \triangle CMD$
- D. $\triangle ABM, \triangle MDC$

Answer: B

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12. 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.



Which criterion of similarity is applicable to similar triangles?

A. SSA

B. ASA

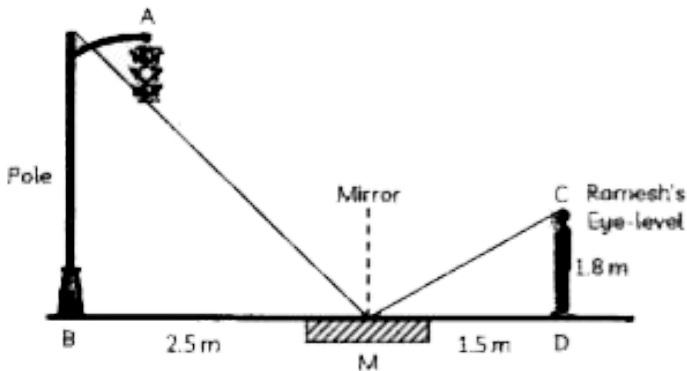
C. SSS

D. AAA

Answer: D

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13. 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.



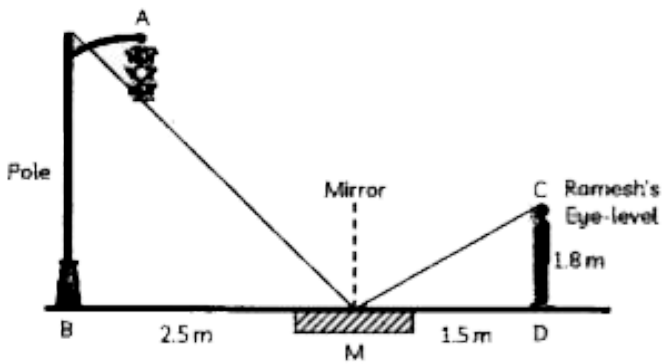
The height of the pole is:

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

Answer: A

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

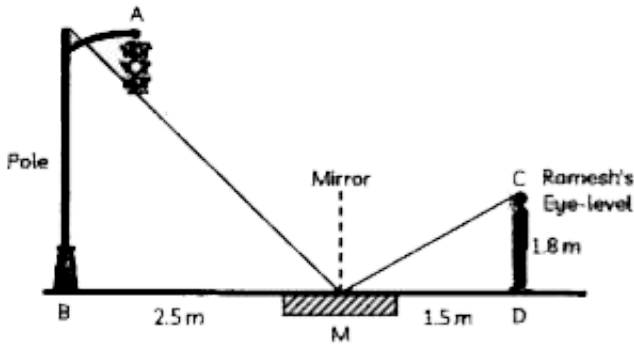
- A. 3 metres
- B. 2.6 metres
- C. 2.2 metres
- D. 2 metres

Answer: D



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15. 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

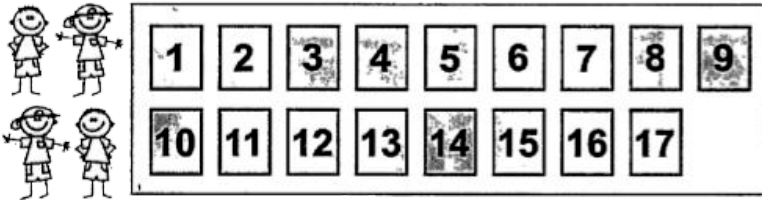
Answer: D



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

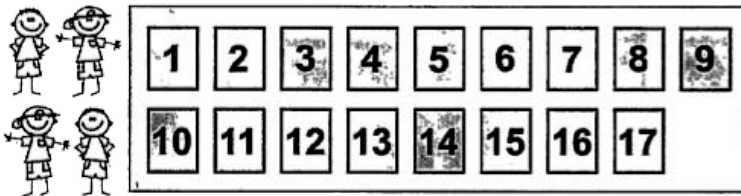
D. $\frac{8}{17}$

Answer: C

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17. 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 by the boy is:

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

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

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

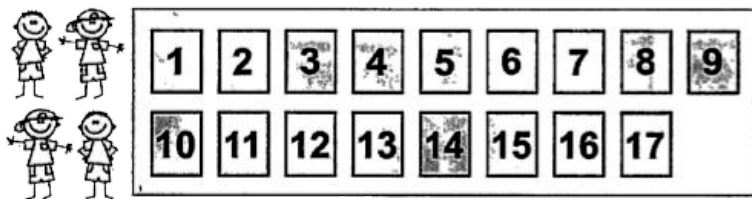
D. $\frac{8}{15}$

Answer: B

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

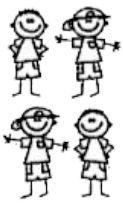
Answer: A



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19. 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 card bearing a number greater than 17 is:

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

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

C. 0

D. 1

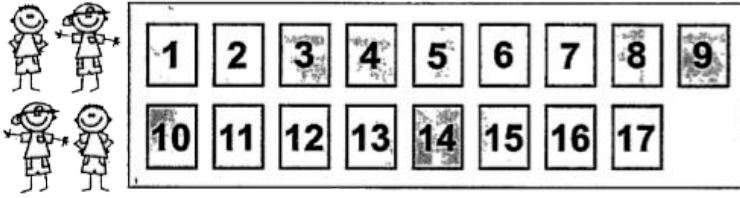
Answer: C

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20. 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 card bearing a multiple of 3 or 7 is:

- A. $\frac{6}{17}$
- B. $\frac{7}{17}$
- C. $\frac{8}{17}$
- D. $\frac{9}{17}$

Answer: B

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Part B Section Iii

1. Solve: $\frac{x-2}{x-3} + \frac{x-4}{x-5} = 3\frac{1}{3}, x \neq 3, 5.$

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

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3. If $a = 2^3 \times 3$, $b = 2 \times 3 \times 5$, $c = 3^n \times 5$ and LCM
(a, b, c) = $2^3 \times 3^2 \times 5$, then $n =$ (a) 1 (b) 2 (c) 3 (d) 4

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4. Prove that the points (a, a) , $(-a, -a)$ and $(-a\sqrt{3}, a\sqrt{3})$ are the vertices of an equilateral triangle.

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

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



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7. A solid iron rectangular block of dimensions 4.4m, 2.6m and 1m is cast into a hollow cylindrical pipe of internal radius 30cm and thickness 5cm. Find the length of the pipe.



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8. Find the mode of the following frequency distribution:

Class	100 – 110	110 – 120	120 – 130	130 – 140	140 – 150	150 – 160
Frequency	4	6	20	32	33	8



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1. Prove that $3\sqrt{2}$ is an irrational number.

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2. Find the solution of the pair of equations:

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

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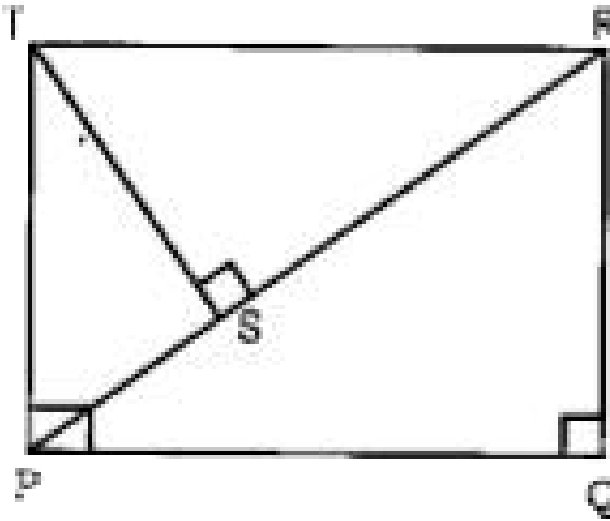
3. Point P divides the line segment joining the points $A(2, 1)$ and $B(5, -8)$ such that $AP/AB=1/3$. If P lies on the line $2x - y + k = 0$, find the value of k.

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4. Prove that in a right angle triangle, the square of the hypotenuse is equal to the sum of the squares of other two sides.

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5. 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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6. Prove that : $\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = 2\operatorname{cosec} \theta$

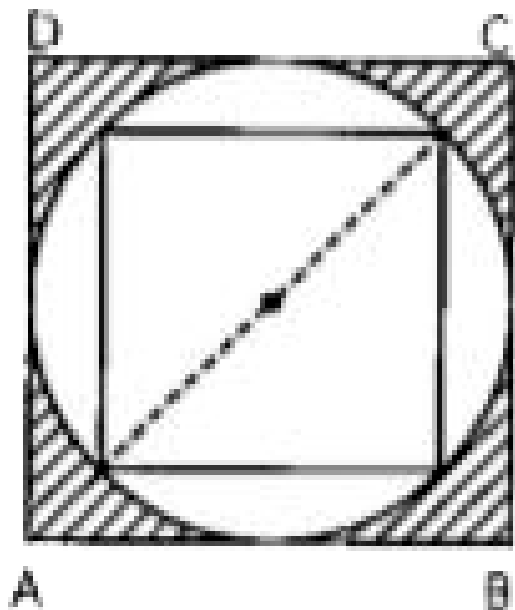
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7. If h , c , V are respectively the height, the curved surface and the volume of a cone, prove that $3\pi Vh^3 - C^2h^2 + 9V^2 = 0$.

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8. 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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9. 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:

Length (in mm):	118-126	127-135	136-144	145-153	154-162	163-171	172-180	No.
of leaves:	3	5	9	12	5	4	2	

Find the mean length of leaf.

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1. 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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2. 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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3. O is the centre of a 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 length of AB .

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4. 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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