



# MATHS

## BOOKS - EDUCART PUBLICATION

### SAMPLE PAPER SOLVED 9

#### Part A Section I

1. Explain why  $3 \times 5 \times 7 + 7$  is a composite number.



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2. Find the distance of the point  $(7,-8)$  from the origin



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3. Find the ratio in which the line segment joining the points  $(-1,7)$  and  $(4,-3)$  is divided by the point  $(1,3)$ .



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4. For the following distribution, find the sum of the lower limits of the median class and the modal

class:

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9



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5.  $\triangle ABC$  is an equilateral triangle such that  $AD \perp BC$ , then  $AD^2 =$



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6. An equilateral triangle  $ABC$  is inscribed in a circle with centre  $O$ . The measures of  $\angle BOC$  is  $30^\circ$   
(b)  $60^\circ$  (c)  $90^\circ$  (d)  $120^\circ$



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7. Find the value of  $4 \tan^2 A - 4 \sec^2 A$ .



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



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9. What is the perimeter of triangle with vertices  $(0,0)$ ,  $(1,0)$  and  $(0,1)$ .



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10. On melting a solid sphere of lead of radius 8 cm, find the number of spherical balls of radius 1 cm that can be made?



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11. If the area of a sector of a circle of radius 2 cm is  $\pi$  sq m, then what is the central angle of the sector ?



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12. If 18,  $a$ ,  $b$ ,  $-3$  are in AP, then  $a + b =$



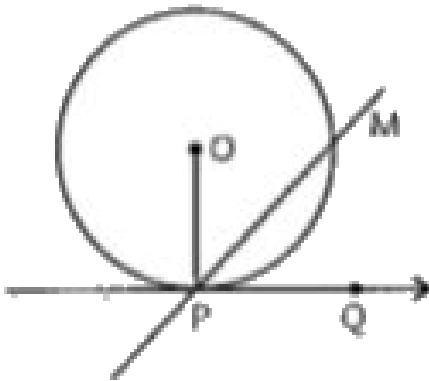
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13. In  $\triangle ABC$ ,  $D$  and  $E$  are points on the sides  $AB$  and  $AC$  respectively, such that  $DE \parallel BC$ . If

AD=2.5cm,BD=3cm and AE =3.75 cm , then the value of AC.

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14. In the given figure ,if  $\angle MPQ = 40^\circ$  , then find the  $\angle OPM$ .



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**15.** A box contains 7 red balls and 6 blue ball. A ball is drawn at random from the box .The probability that this drawn is a blue ball.



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**16.** The relation between mean, mode and median is



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17. If the product of the zeros of the polynomial  $ax^2 - 6x - 12$  is 4, then find the value of 'a'.



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18. If  $a_n$  denotes the  $n$ th term of the AP 3, 18, 13, 18,... then what is the value of  $(a_{30} - a_{20})$ ?



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19. In an A.P., if  $a=21$ ,  $d=-3$  and  $a_n = 0$ , then find the value of 'n'.



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20. Write a quadratic polynomial whose zeros are -7 and 5.



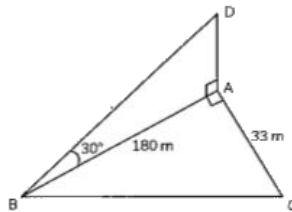
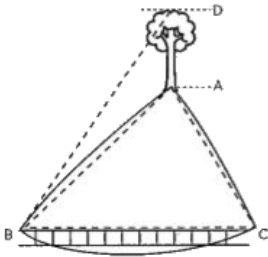
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21. Solve for  $x$  and  $y$ :  $x + y = 2$  and  $2x - y = 1$



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1. A playgroup school is looking to refurbish the playground area that is in almost a triangular shape (ABC). There is a small tree, almost a vertical line in shape let's say AD, at the corner of the playground area



A path runs along the edge BC of the field. As part of material purchase planning, the playgroup manager needs to scope out the surrounding area including the dimensions of the tree.

The height of the tree AD is :

A.  $29\sqrt{3}$  m

B.  $38\sqrt{3}$  m

C.  $43\sqrt{3}$  m

D.  $60\sqrt{3}$  m

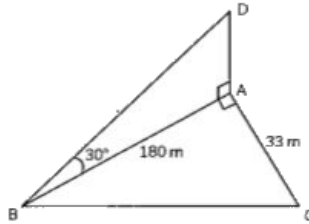
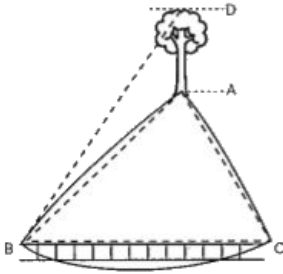
**Answer: D**



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2. A playgroup school is looking to refurnish the playground area that is in almost a triangular shape (ABC). There is a small tree, almost a vertical line in shape let's say AD, at the corner of the

# playground area



A path runs along the edge BC of the field .As part of material purchase planning ,the playgroup manager needs to scope out the surrounding area including the dimensions of the tree.

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

The length of the path BC is :

A. 193 m

B. 189 m

C. 188 m

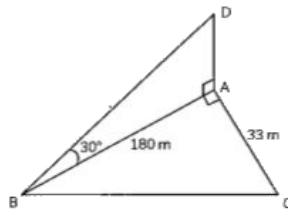
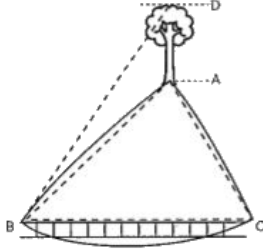
D. 183 m

**Answer: D**



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3. A playgroup school is looking to refurnish the playground area that is in almost a triangular shape (ABC). There is a small tree, almost a vertical line in shape let's say AD, at the corner of the playground area



A path runs along the edge BC of the field .As part of material purchase planning ,the playgroup manager needs to scope out the surrounding area including the dimensions of the tree.

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

The area (in sq m) of the field ABC is :

A. 2790 sq m

B. 2970 sq m

C. 3102 sq m

D. 3210 sq m

**Answer: B**



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4. In  $\triangle ABC$ , right angled at B, if  $AB = 6m$  and  $\angle BAC = 30^\circ$ , find  $BC^2 + AC^2$

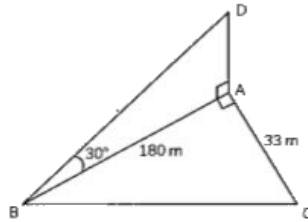
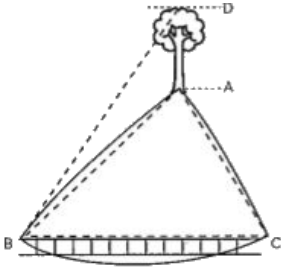


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5. A playgroup school is looking to refurnish the playground area that is in almost a triangular



shape (ABC) .There is a small tree ,almost a vertical line in shape lets say AD, at the corner of the playground area



A path runs along the edge BC of the field .As part of material purchase planning ,the playgroup manager needs to scope out the surrounding area including the dimensions of the tree.

The length BD is :

A. 198 m

B. 208 m

C. 228 m

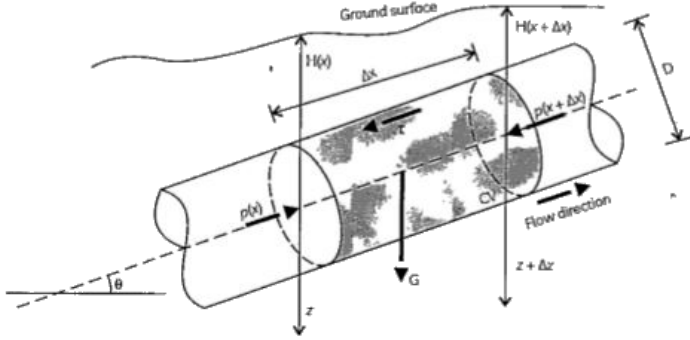
D. 243 m

**Answer: B**



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**6.** In CERN , some work is carried out for developing an accurate and fast numerical method that can calculate natural gas flow in a pipeline under non isothermal steady -state conditions .



The cross section of the pipeline is shown below:

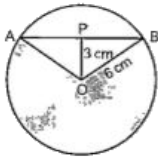


Diagram 1

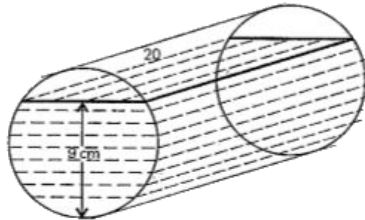


Diagram 2

In Diagram 1, O is the centre of the circle of radius 6 cm and P is the mid-point of the chord AB. The length OP is 3 cm.

The measure of  $\angle AOB$  is :

A.  $60^\circ$

B.  $75^\circ$

C.  $120^\circ$

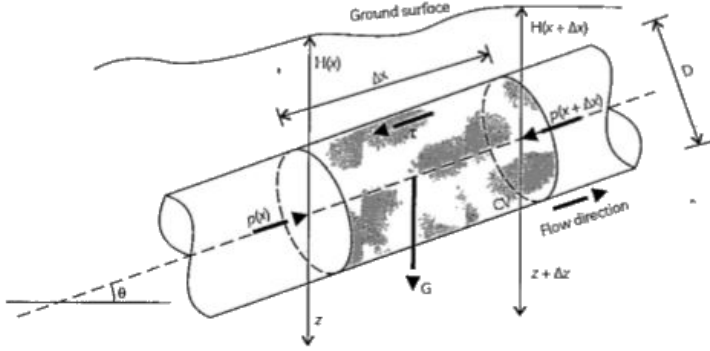
D.  $135^\circ$

**Answer: C**



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7. In CERN , some work is carried out for developing an accurate and fast numerical method that can calculate natural gas flow in a pipeline under non isothermal steady -state conditions .



The cross section of the pipeline is shown below:

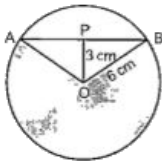


Diagram 1

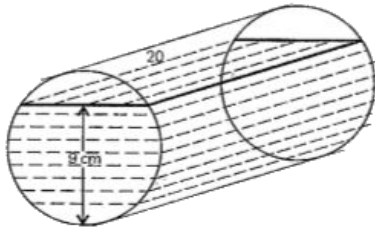


Diagram 2

In Diagram 1, O is the centre of the circle of radius 6 cm and P is the mid-point of the chord AB. The length OP is 3 cm.

The area (in sq cm ) of  $\Delta AOB$  is :

A. 5.2

B. 10.4

C. 15.6

D. 20.8

**Answer: C**



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8. O is the centre of the circle of radius 6 cm and P is the mid -point of a chord AB .The length OP is 3 cm. The area (in sq cm ) of  $\triangle AOB$  is :

A.  $26\pi$

B.  $24\pi$

C.  $20\pi$

D.  $18\pi$

**Answer: B**



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9. A cylindrical vessel, which has radius 6 cm and length 21 cm , contains liquid. The volume (in cu cm) of liquid in the vessel is :

A. 1584

B. 1680

C. 1507

D. 1820

**Answer: C**



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**10.** A cylindrical vessel of radius 3 cm is 6 cm long.

The total surface area (in sq cm ) of the cylindrical vessel is:

A.  $312\pi$

B.  $262\pi$



C.  $256\pi$

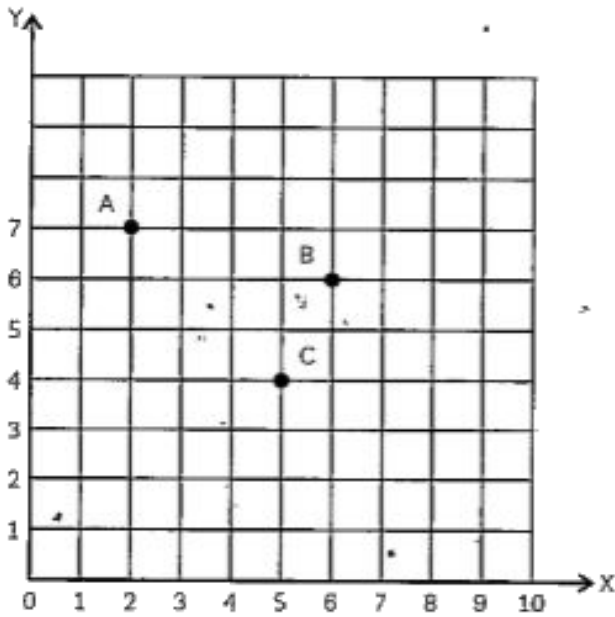
D.  $284\pi$

**Answer: A**



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**11.** Resident Welfare Association (RWA) of a M2 K Society in Azadpur have put up three electric poles A,B and C in a society 's common park near Tower A . Despite these poles ,some parts of the park are still in dark. So , RWA decides to have one more electron pole D in the park.



The position of the pole C is :

A. (5,4)

B. (2,7)

C. (8,9)

D. (9,8)

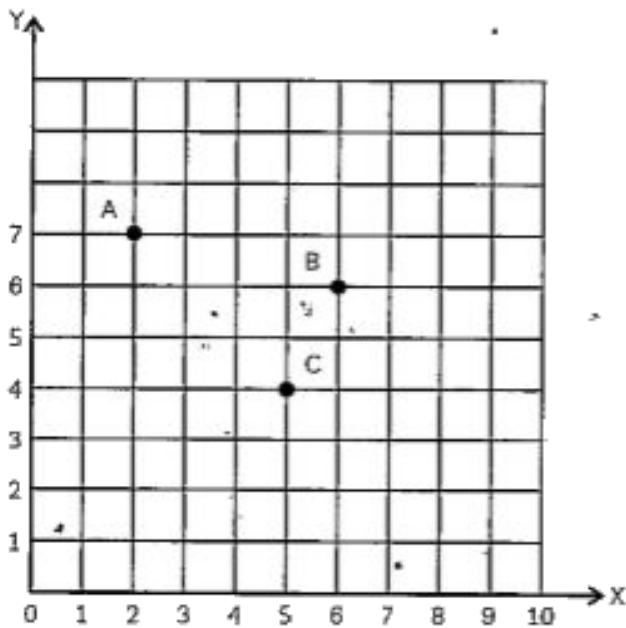
**Answer: A**



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**12.** Resident Welfare Association (RWA) of a M2 K Society in Azadpur have put up three electric poles A,B and C in a society 's common park near Tower A . Despite these poles ,some parts of the park are still in dark. So , RWA decides to have one more

electron pole D in the park.



The distance of the pole B from the corner O of the park is :

A.  $\sqrt{53}$  units

B.  $\sqrt{41}$  units

C.  $\sqrt{72}$  units

D.  $\sqrt{145}$  units

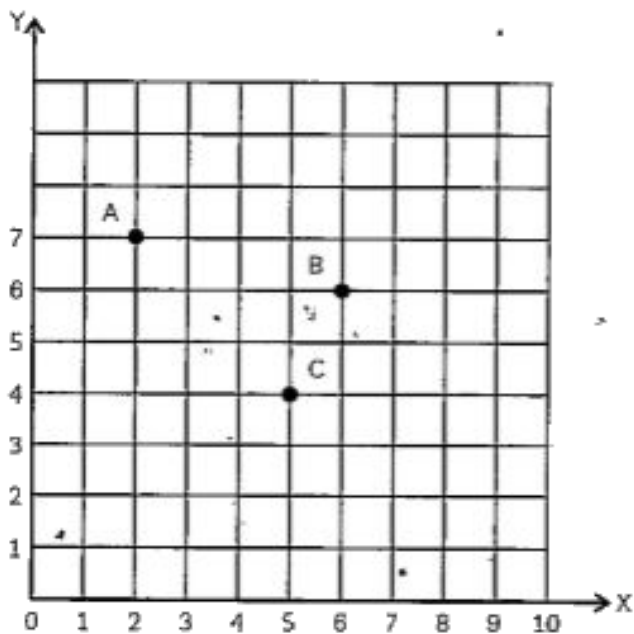
**Answer: C**



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**13.** Resident Welfare Association (RWA) of a M2 K Society in Azadpur have put up three electric poles A,B and C in a society 's common park near Tower A . Despite these poles ,some parts of the park are

still in dark. So , RWA decides to have one more electron pole D in the park.



The position of the fourth pole D so that four points A,B,C and D form a parallelogram is :

A. (1,4)

B. (1,5)

C. (2,3)

D. (5,1)

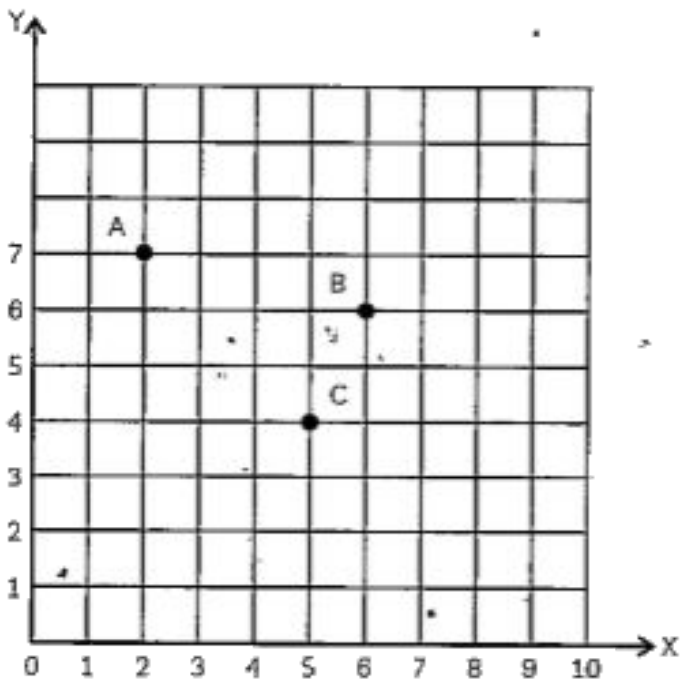
**Answer: B**



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**14.** Resident Welfare Association (RWA) of a M2 K Society in Azadpur have put up three electric poles A,B and C in a society 's common park near Tower A . Despite these poles ,some parts of the park are still in dark. So , RWA decides to have one more electron pole D in the park.





On the basis of the above information ,answer any

four of the following questions :

The distance between poles A and C is :

A.  $\sqrt{18}$  units

B.  $\sqrt{17}$  units

C.  $\sqrt{5}$  units

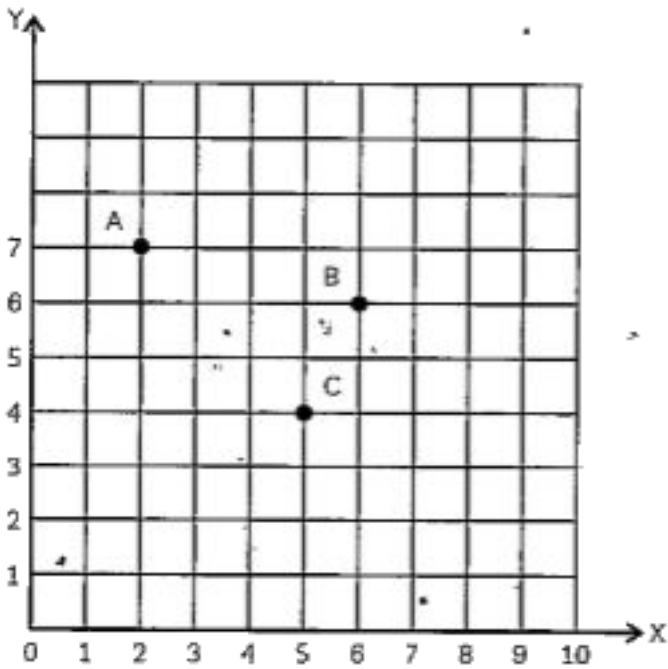
D.  $\sqrt{34}$  units

**Answer: A**



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**15.** Resident Welfare Association (RWA) of a M2 K Society in Azadpur have put up three electric poles A,B and C in a society 's common park near Tower A . Despite these poles ,some parts of the park are still in dark. So , RWA decides to have one more electron pole D in the park.



Plot a point D so that ABCD becomes parallelogram

.The distance between poles B and D is :

A.  $\sqrt{24}$  units

B.  $\sqrt{17}$  units

C.  $\sqrt{5}$  units

D.  $\sqrt{26}$  units

**Answer: D**



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**Part B Section Iii**

1. Write any two irrational numbers whose product is rational number.



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2. If the zeroes of the polynomial  $x^3 - 3x^2 + x + 1$  are  $a, b, a + b$ , find  $a$  and  $b$ .



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3. Given the linear equation  $2x + 3y - 8 = 0$  , write another linear equation in two variables such that the geometrical representation of the pair so formed is: (i) intersecting lines (ii) parallel lines (iii) coincident lines



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4. The product of A's age 5 years ago with his age 9 years later is 15. Find A's present age .



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5. If  $x = r \sin A \cos C$ ,  $y = r \sin A \sin C$  and  $z = r \cos A$ , prove that  $r^2 = x^2 + y^2 + z^2$



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6. Prove that :

$$(\tan \theta + 2)(2 \tan \theta + 1) = 5 \tan \theta + 2 \sec^2 \theta$$



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7. A cow is tied with a rope of length 14m at the corner of a rectangular field of dimensions



$20m \times 16m$  . Find the area of the field in which the cow can graze.



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8. Determine the mean of the following data :

x	2	4	3	7	9	5
f	5	6	8	12	10	7



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## Part B Section Iv

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



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2. Ms Jayshree recently completed her post graduate diploma in human resource management. A few months from now a large steel manufacturing company appointed her as its human resource manager. As of new, the company employs 800 persons and has an another 200 persons for various types of additional requirements. Ms Jayshree has been given complete charge of the company's human resource department.

What problems do you foresee in her job ?



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3. Sushma and Harika started a business with investments of ₹ 4500 and ₹ 5500 respectively. After 6 months Sai joined them with an investment of ₹ 7000. Find the total share of Sushma and Harika in the annual profit of ₹ 27000.



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4. Ms Jayshree recently completed her post graduate diploma in human resource

management. A few months from now a large steel manufacturing company appointed her as its human resource manager. As of now, the company employs 800 persons and has an another 200 persons for various types of additional requirements. Ms Jayshree has been given complete charge of the company's human resource department.

What problems do you foresee in her job ?



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5. Find the roots of the equation :

$$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30} \quad (x \neq -4, 7)$$



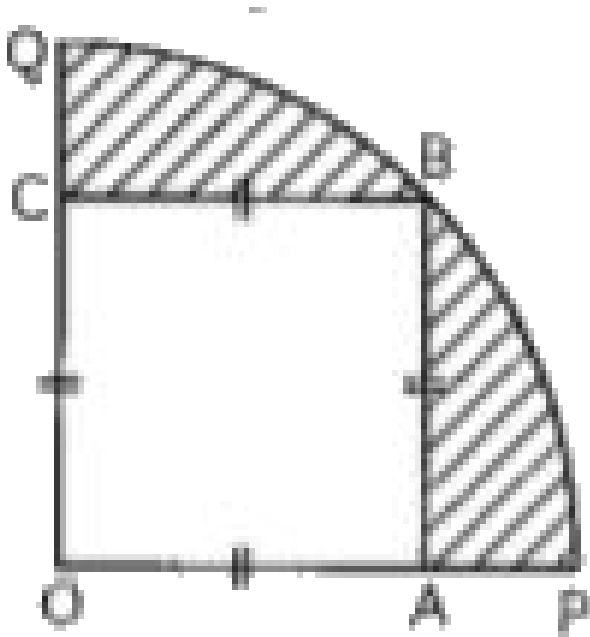
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6. Find a fraction which becomes  $\frac{1}{2}$  when the denominator is increased by 4, and  $\frac{1}{8}$  when the numerator is decreased by 5.



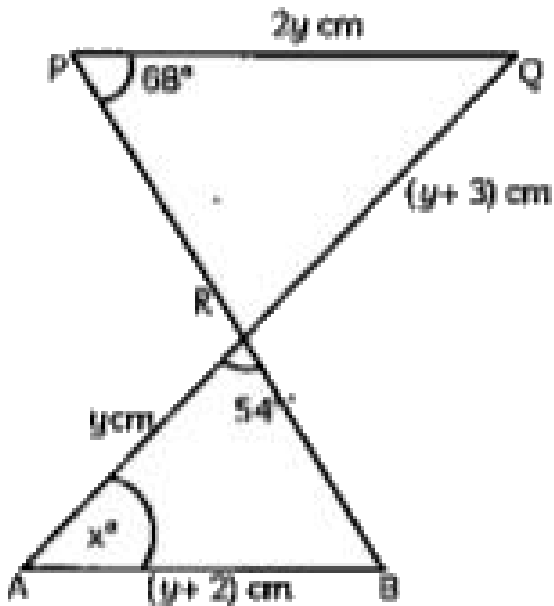
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7. In the figure , a square  $OABC$  is inscribed in a quadrant  $OPBQ$  . If  $OA = 20$  cm , find the area of the shaded region.



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8. Given that  $\triangle PQR$  is similar to  $\triangle BAR$ . Find the value of  $y$ ,



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**9.** Draw a circle of radius 4 cm. From the point 7 cm away from its centre, construct the pair of tangents to the circle.



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**10.** State and prove the Pythagoras theorem.



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**11.** The annual rainfall record of a city for 66 days is given below in the table :



Rainfall (in cm)	0-10	10-20	20-30	30-40	40-50	50-60
Number of days	22	10	8	15	5	6

Calculate the median rainfall ,using the formula .



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## Part B Section V

1. Solve for x and y:

$$4x - 2y = 3, 2x + y = 1$$



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2. A circle touches all the four sides of a quadrilateral  $ABCD$ . Prove that:

$$AB + CD = BC + DA.$$



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3. 
$$\frac{\cot \theta - \operatorname{cosec} \theta + 1}{\cot \theta + \operatorname{cosec} \theta - 1} = ?$$



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4. Prove that

$$\frac{\tan A}{(1 - \cot A)} + \frac{\cot A}{(1 - \tan A)} = (1 + \tan A + \cot A).$$



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