



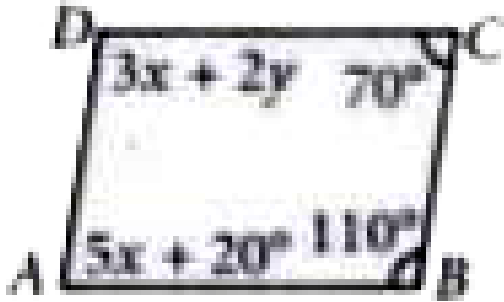
# MATHS

## BOOKS - MTG IIT JEE FOUNDATION

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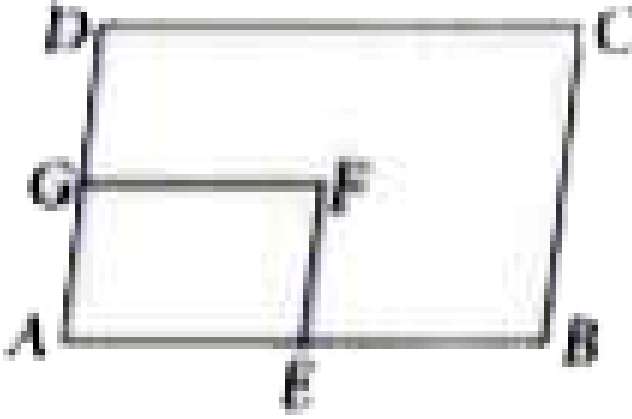
#### Part A Section I

1. In the figure , ABCD is a parallelogram . Then find the value of  $x$  and  $y$ .



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2. In the given figure,  $ABCD$  and  $AEFG$  are two parallelograms. If  $\angle C = 55^\circ$ , then find  $\angle F$ .



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3. If  $(k+2, 3k+2)$  is a solution of the linear equation  $3x-5y=13$ , then find the value of  $k$ .

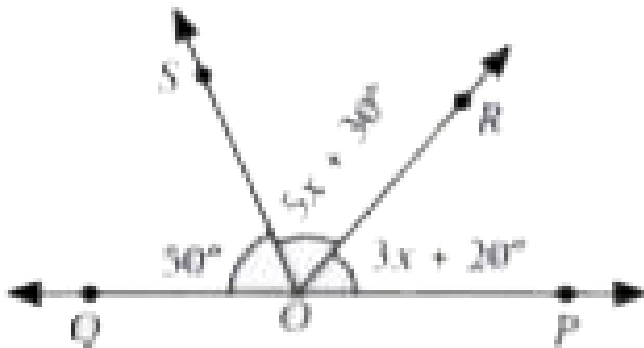
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4. Simplify  $(81)^{0.16} \times (81)^{0.09}$



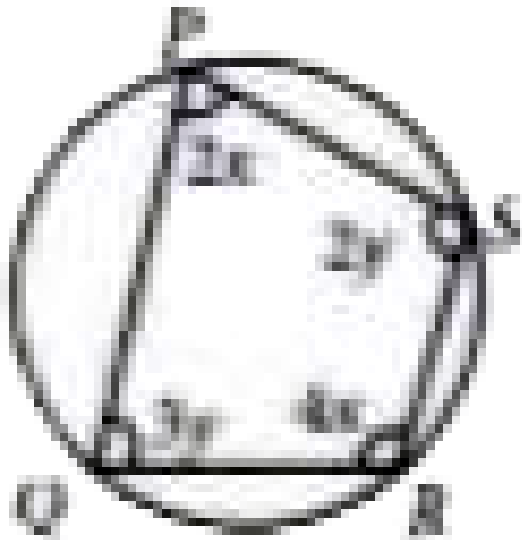
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5. In the given figure, find the value of  $x$ .



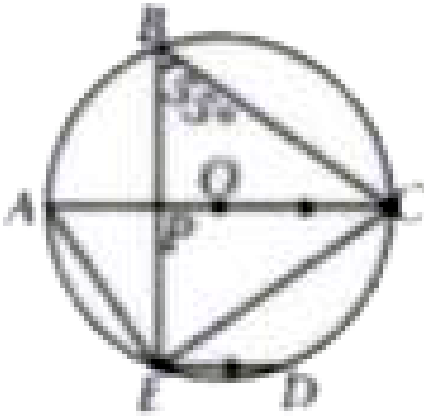
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6. In the given figure, if PQRS is a cyclic quadrilateral with respective angles. Find , the ratio of x and y.



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7. In the given figure , find  $\angle CAE$



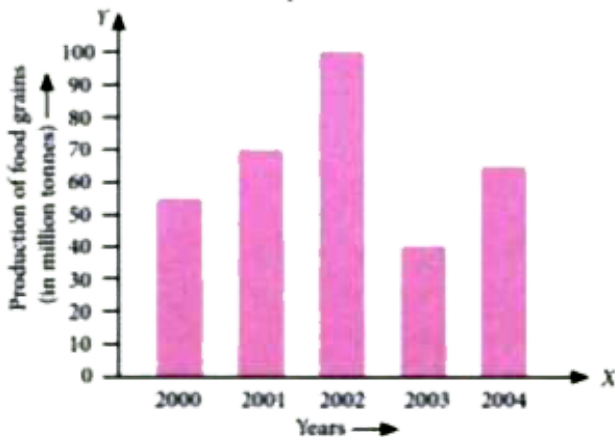
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8. If the coordinates of two points are  $A(3,4)$  and  $B(-2,5)$ , then find the value of (abscissa of A) - (abscissa of B).





9. Read the bar graph given below which shows production of food grains in an Indian state during 5 consecutive years and answer the questions that follows :



After which year, was there a sudden fall in the production ?



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10. In triangles  $ABC$  and  $DEF$ ,  $\angle A = \angle D$ ,  $\angle B = \angle E$  and  $AB=EF$ . Will the two triangles be congruent ? Give reasons for your answer.



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11. Find an irrational number between  $\frac{1}{5}$  and  $\frac{2}{5}$





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12. If  $(2^5)^2 = 4^x$ , then find the value of  $3^x$ .



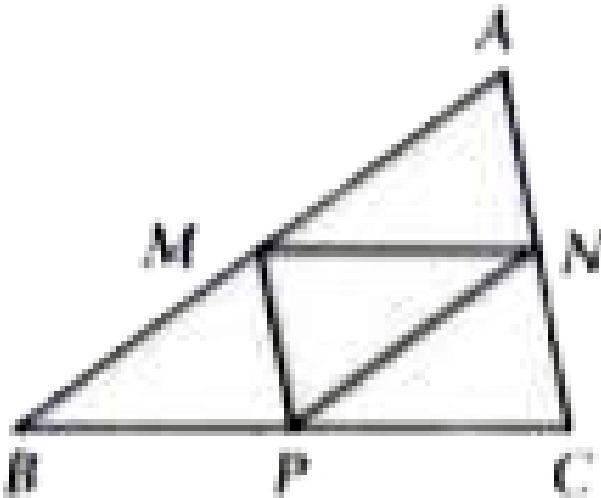
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13. If  $(2,0)$  is a solution of the linear equations  $2x+3y=k$ , then find the value of  $k$ .



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14. If the given figure , M, N and P are the mid-points of AB, AC and BC respectively. If  $MN=3$  cm,  $NP=3.5$  cm and  $MP=2.5$  cm, calculate BC , AB and AC



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**15.** Three coins are tossed simultaneously 100 times. The following outcomes are recorded :

Outcomes	3 tails	2 tails	1 tail	no tail
Frequency	23	28	23	26

Find the probability of getting more than one tail.



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**16.** Find  $f(0)$  for  $f(t) = 3t^2 - 10t + 6$ .



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17. 30 children were asked about the number of hours they watched TV programmes last week. The result are recorded as under

<b>Number of hours</b>	0-5	5-10	10-15	15-20
<b>Frequency</b>	8	16	4	2

Can we say that the number of children who watched TV for 10 or more hour in a week 22?  
Justify your answer.



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**18.** In a bar graph, 0.2 cm length of a bar represents 100 people . What is the length of bar which represents 1300 people ?



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**19.** Find the point at which the graph of the linear equation  $2x+3y=6$  cuts the x-axis.



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20. Is  $x=3, y=0$  , a solution of  $y-3 = 0$  ?



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## Part A Section Ii

1. Following frequency distribution gives the weights of 38 students of a class :

Weight (in kg)	31- 35	36- 40	41- 45	46- 50	51- 55	56- 60	61- 65	66- 70	71- 75
Number of students	9	5	14	3	1	2	2	1	1

Based on the above information, answer the

following questions.

Define an event whose probability is 1.

A. weight is more than 50 kg

B. weight is less than 31 kg

C. weight is at least 31 kg

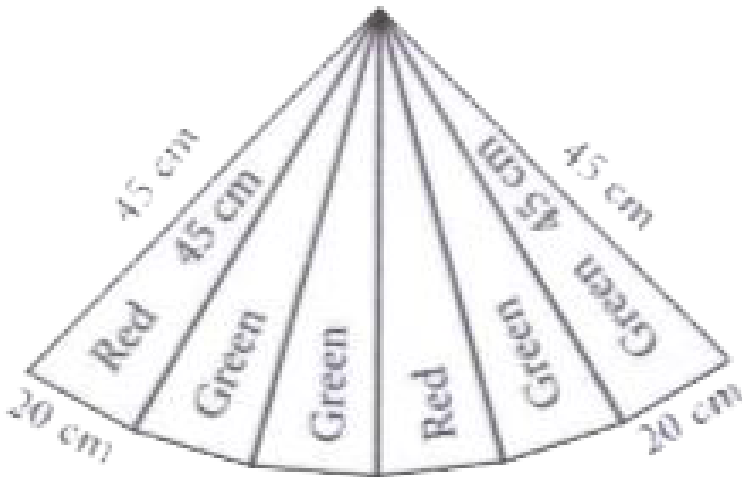
D. None of these

**Answer: C**



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2. On the occasion of diwali , Sneha made a rangoli. By using two different colours red and green as shown in given figure. Answer the following questions :



Find the semi-perimeter of 1 triangle.



A. 22 cm

B. 44 cm

C. 55 cm

D. 67 cm

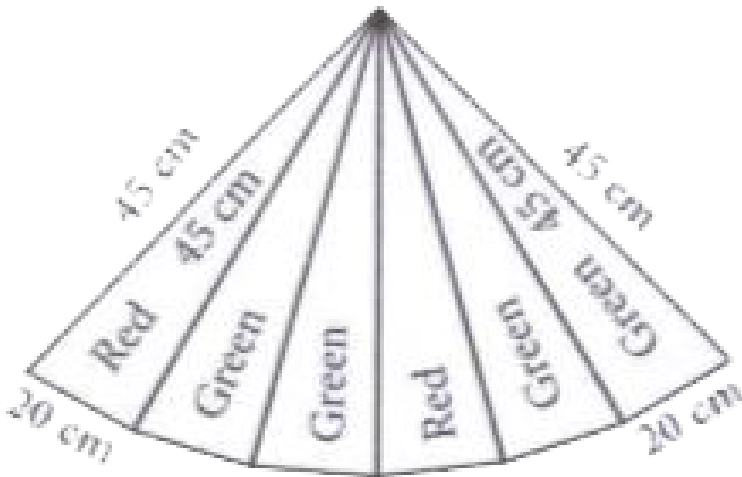
**Answer: C**



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**3.** On the occasion of diwali , Sneha made a rangoli. By using two different colours red and green as shown in given figure. Answer the

following questions :



Find the area of rangoli covered by red colour

A.  $50\sqrt{77}\text{cm}^2$

B.  $100\sqrt{77}\text{cm}^2$

C.  $150\sqrt{77}\text{cm}^2$

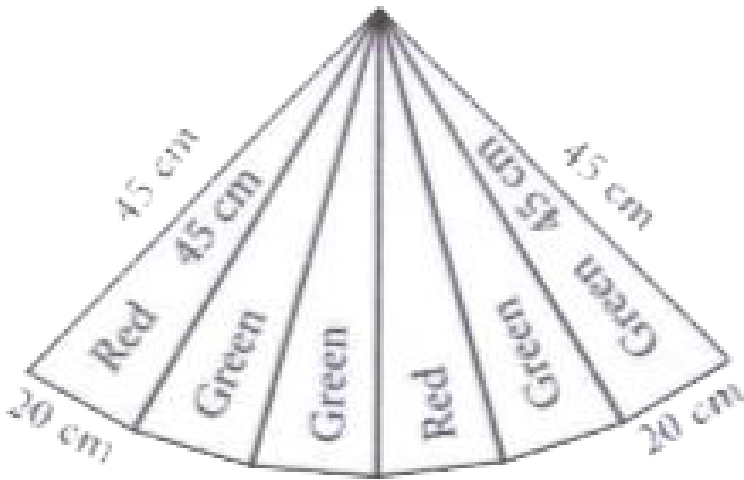
D.  $35 \text{ cm}^2$

**Answer: B**



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4. On the occasion of diwali , Sneha made a rangoli. By using two different colours red and green as shown in given figure. Answer the following questions :



Find the area of rangoli covered by green colour

A.  $192 \text{ cm}^2$

B.  $386 \text{ cm}^2$

C.  $215 \text{ cm}^2$

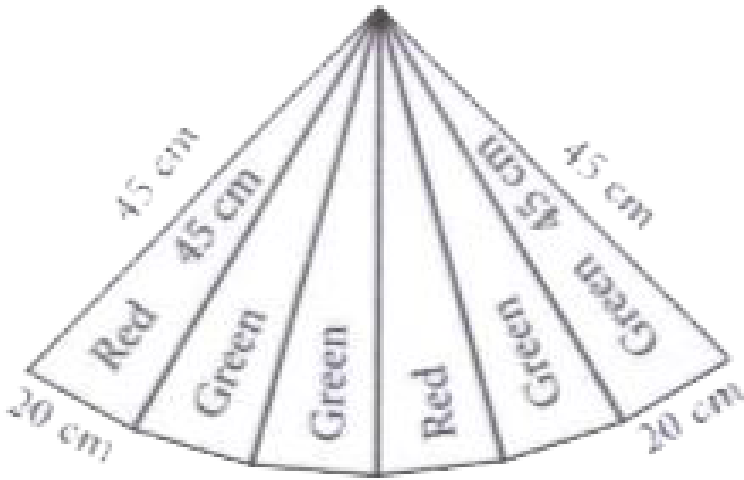
$$D. 200\sqrt{77} \text{ cm}^2$$

**Answer: D**



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5. On the occasion of diwali , Sneha made a rangoli. By using two different colours red and green as shown in given figure. Answer the following questions :



What is the total area used for rangoli ?

A.  $300\sqrt{77} \text{ cm}^2$

B.  $250 \text{ cm}^2$

C.  $350 \text{ cm}^2$

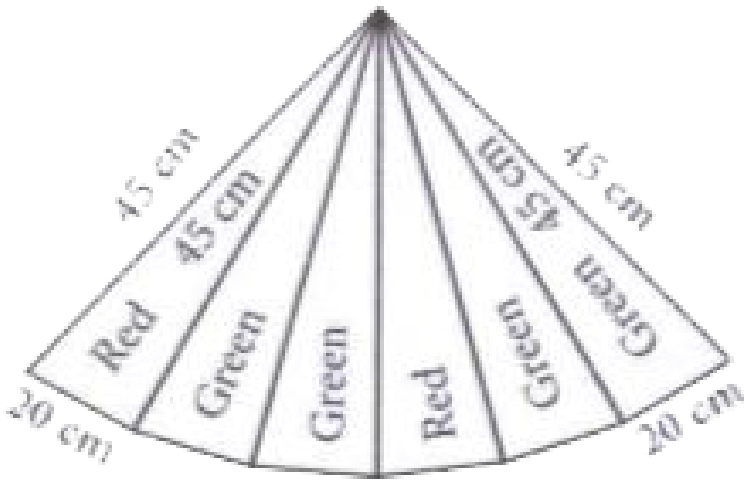
D.  $216\sqrt{77} \text{ cm}^2$

**Answer: A**



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**6.** On the occasion of diwali , Sneha made a rangoli. By using two different colours red and green as shown in given figure. Answer the following questions :



If the cost of colours is Rs. 5.5 per  $\text{cm}^2$ , then find the total cost of colours used in rangoli approximately.

A. Rs. 14478

B. Rs. 9630

C. Rs. 15840



D. Rs. 14444

**Answer: A**



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7. Polynomials are widely used in the field of medicine and pharmaceuticals like drug testing. Many drugs tested on various patients to check their effects. Likewise, the given polynomials is used to understand the concentration of a particular drug in the

blood of a patient at various intervals of time .



$C$  = concentration of drug in blood  
after  $t$  hours  
 $C(t) = -2t^3 + 6t^2 - 8t + 8$  mg/decilitre

Based on the above information , answer the following questions .

The coefficient of  $t$  in the given polynomial is

A.  $-2$

B.  $6$

C.  $-8$

D.  $8$

**Answer: C**



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8. Polynomials are widely used in the field of medicine and pharmaceuticals like drug testing. Many drugs tested on various patients to check their effects. Likewise, the given polynomials is used to understand the concentration of a particular drug in the blood of a patient at various intervals of time .



$C$  = concentration of drug in blood  
after  $t$  hours

$$C(t) = -2t^3 + 6t^2 - 8t + 8 \text{ mg/decilitre}$$

Based on the above information , answer the following questions .

What is the degree of the given polynomial ?

A. 1

B. 2

C. 3

D. Can't say

**Answer: C**



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9. Polynomials are widely used in the field of medicine and pharmaceuticals like drug testing. Many drugs tested on various patients to check their effects. Likewise, the given polynomials is used to understand the concentration of a particular drug in the blood of a patient at various intervals of time .



$C$  = concentration of drug in blood  
after  $t$  hours  
 $C(t) = -2t^3 + 6t^2 - 8t + 8$  mg/decilitre

Based on the above information , answer the following questions .

What is the value of the polynomial if the value of the variable is 0 ?

A. 1

B. 0

C.  $-2$

D. 8

**Answer: D**



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**10.** Polynomials are widely used in the field of medicine and pharmaceuticals like drug testing. Many drugs tested on various patients to check their effects. Likewise, the given polynomials is used to understand the concentration of a particular drug in the blood of a patient at various intervals of time .



$C$  = concentration of drug in blood  
after  $t$  hours

$$C(t) = -2t^3 + 6t^2 - 8t + 8 \text{ mg/decilitre}$$

Based on the above information , answer the

following questions .

Find the value of C when  $t=-1$

A. 4

B. 24

C. 0

D.  $-8$

**Answer: B**



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**11.** Polynomials are widely used in the field of medicine and pharmaceuticals like drug testing. Many drugs tested on various patients to check their effects. Likewise, the given polynomials is used to understand the concentration of a particular drug in the blood of a patient at various intervals of time .



$C$  = concentration of drug in blood  
after  $t$  hours

$$C(t) = -2t^3 + 6t^2 - 8t + 8 \text{ mg/decilitre}$$

Based on the above information , answer the following questions .

For which value(s) of 't', the value of the polynomial is 0 ?

A. 2

B.  $-2$

C. 1

D. All of these

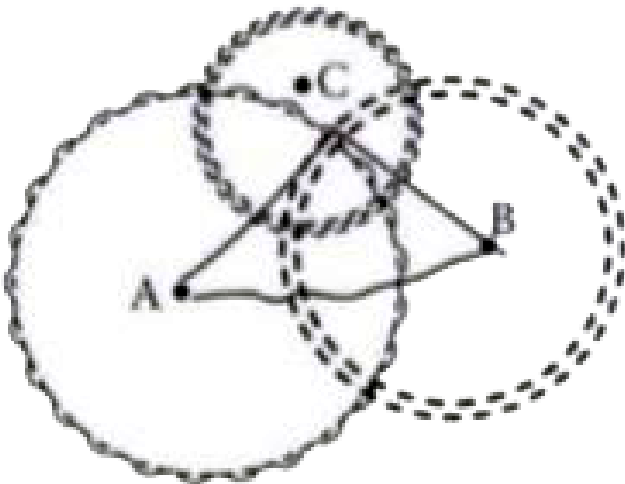
**Answer: A**



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12. Geeta is doing embroidery. She made three circles of various sizes on a table cloth as shown here. Answer the following questions if the circles are of radii 5 cm , 10 cm and 13 cm

Based on the above information , answer the following questions.



Find the length of chord EF drawn to the

smallest circle at a distance of 4 cm from its centre.

A. 3 cm

B. 6 cm

C. 8 cm

D. 10 cm

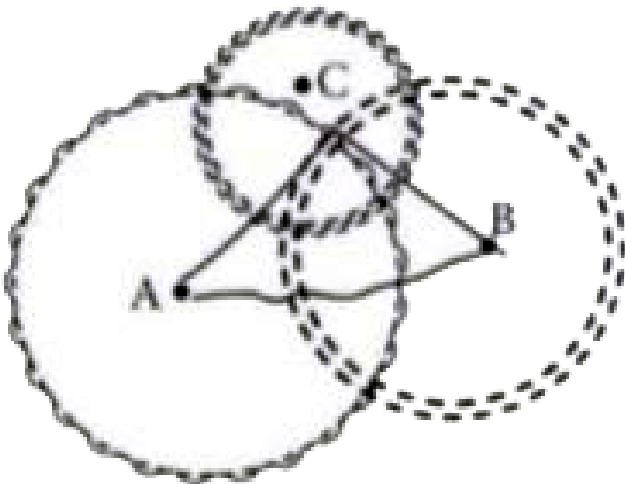
**Answer: B**



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**13.** Geeta is doing embroidery. She made three circles of various sizes on a table cloth as shown here. Answer the following questions if the circles are of radii 5 cm , 10 cm and 13 cm

Based on the above information , answer the following questions.



The chord EF makes angle  $50^\circ$  at centre of

circle with centre C , then angle made by it in its alternate segment is

A.  $100^\circ$

B.  $50^\circ$

C.  $25^\circ$

D.  $150^\circ$

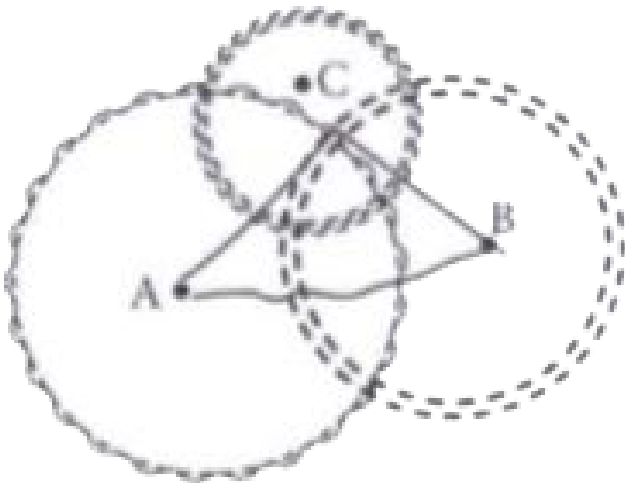
**Answer: C**



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**14.** Geeta is doing embroidery. She made three circles of various sizes on a table cloth as shown here. Answer the following questions if the circles are of radii 5 cm , 10 cm and 13 cm

Based on the above information , answer the following questions.



If the angles subtended by the chord formed

at points of intersection of circle of radius 10 cm and 13 cm is  $70^\circ$  at the centre B, then what is the angle subtended by it in its alternate segment ?

A.  $35^\circ$

B.  $105^\circ$

C.  $140^\circ$

D.  $21^\circ$

**Answer: A**

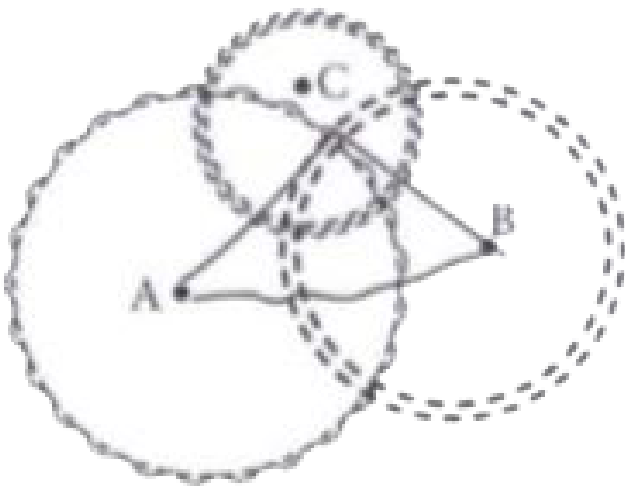


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**15.** Geeta is doing embroidery. She made three circles of various sizes on a table cloth as shown here. Answer the following questions if the circles are of radii 5 cm , 10 cm and 13 cm

Based on the above information , answer the following questions.



X and Y are the two points on circle with centre A. If the common chord PQ of circles with centres A and B subtend an angle of  $60^\circ$  at A, then find the value of  $\angle PXQ + \angle PYQ$

A.  $60^\circ$

B.  $30^\circ$

C.  $90^\circ$

D.  $120^\circ$

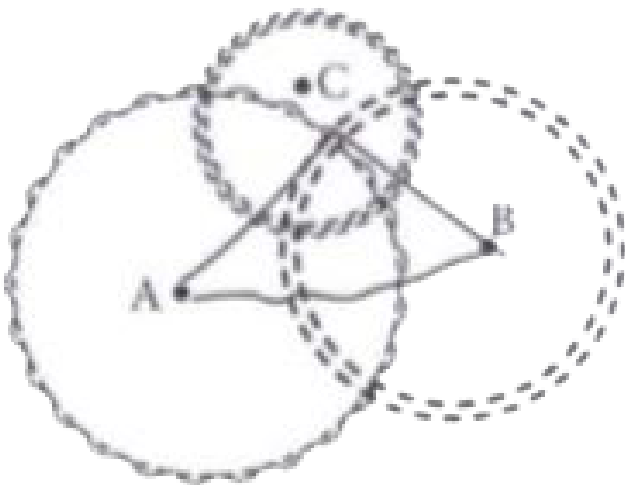
**Answer: A**



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**16.** Geeta is doing embroidery. She made three circles of various sizes on a table cloth as shown here. Answer the following questions if the circles are of radii 5 cm , 10 cm and 13 cm

Based on the above information , answer the following questions.



The sum of either pair of a cyclic quadrilateral is

A.  $90^\circ$

B.  $180^\circ$

C.  $270^\circ$

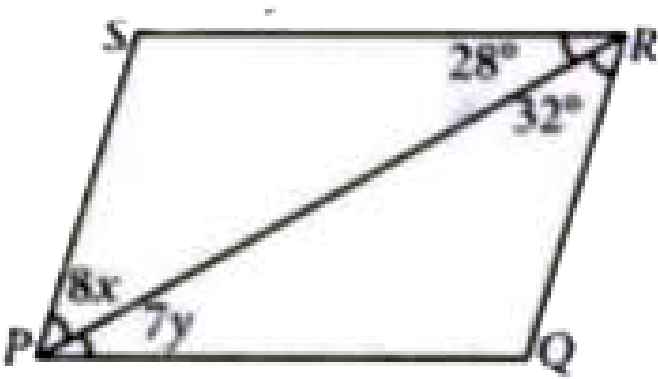
D. None of these

**Answer: B**



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1. In the given figure, If PQRS is a parallelogram, then find the values of  $x$  and  $y$ .



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2. In a survey of 300 volunteers, the following data is obtained :

Male	120
Female	180

A people is chosen at random. Find the probability that the chosen person

(i) is a male

(ii) is a female



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3. A dice was rolled 100 times and the number of times 6 came up was noted. If the experimental probability calculated from this

information is  $\frac{2}{5}$ , then how many times 6 came up? Justify your answer.



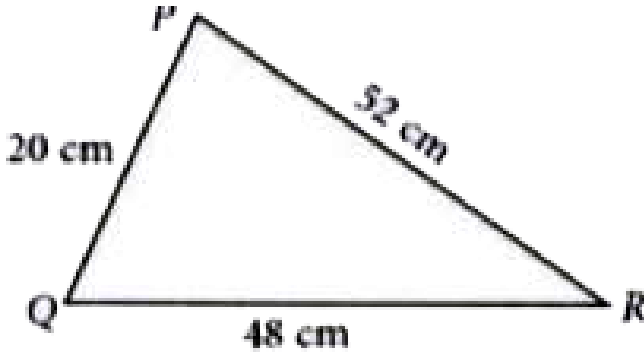
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4. If  $x=2$  and  $x=0$  are zeroes of the polynomial  $2x^3 - 5x^2 + ax + b$ , then find the values of  $a$  and  $b$ .



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5. Find the area of the given triangle.



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6. If a sphere is inscribed in a cube, then prove that the ratio of the volume of the cube to the volume of the sphere will be  $6 : \pi$ .



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7. How many square metres of canvas is required for a conical tent whose height is 3.5 m and the radius of the base is 12 m ?



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8. Using suitable identity, prove that :

$$\frac{(0.67)^3 + (0.33)^3}{(0.67)^2 - (0.67 \times 0.33) + (0.33)^2} = 1$$



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**9.** Insert two irrational numbers between 5 and 6



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**10.** Insert two irrational numbers between  $\frac{2}{3}$  and  $\frac{3}{4}$



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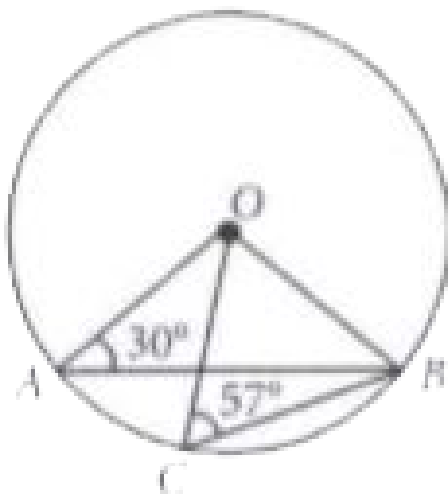
11.  $BC$  is a chord with centre  $O$ .  $A$  is a point on an arc  $BC$  as shown in Figure. Prove that:  
 $\angle BAC - \angle OBC = 90^\circ$ , if  $A$  is the point on the minor arc



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12. In the given figure,  $\angle OAB = 30^\circ$  and  
 $\angle OCB = 57^\circ$

Find  $\angle BOC$



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**13.** Plot the following points on a graph sheet  
and join them in order

$P(-6,4), Q(-4,-3), R(5,-3), S(2,4)$ . Also, mention the quadrants in which the points lie.



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**14.** Draw lines  $PQ$  and  $RS$  intersecting at point  $O$ . Measure a pair of vertically opposite angles. Bisect them. Are the bisecting rays forming a straight line ?



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15. Draw a line  $AB=7.9$  cm and draw perpendiculars at A and B. Are these two perpendiculars parallel to each other?



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16. If  $a = \sqrt{8} + \sqrt{7}$ , then find the value of  $a^2 - 2 + \frac{1}{a^2}$



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17. ABC is a right triangle with  $AB = AC$ . If bisector of  $\angle A$  meet BC at D then prove that  $BC = 2 AD$ .



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## Part B Section Iv

1. Draw the graph of the following equations on the same graph sheet.

$$x=4, x=2, y=1, y-3=0$$

Also, find the area enclosed between these lines.



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2. Draw the graph of the linear equation  $y-x=2$ .  
Find the points of intersection of it with both axes.



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3. Length of a classroom is three times its height and its breadth is  $2\frac{1}{2}$  times its height.

The cost of white-washing the walls at the rate of Rs.1.60 per  $m^2$  is Rs. 158.4 . Find the cost of tiling the floor at the rate of Rs. 10 per  $m^2$



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4. Prove that the line segment joining the mid-points of the diagonals of a trapezium is

parallel to each of the parallel sides and is equal to half the difference of these sides.



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