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MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER (SELF ASSESSMENT) 12

Part A Section I

1. Two concentric circles are of radii 5 cm. and 3 c. Find the length of the chord of the larger circle which touches the cmaller circle.

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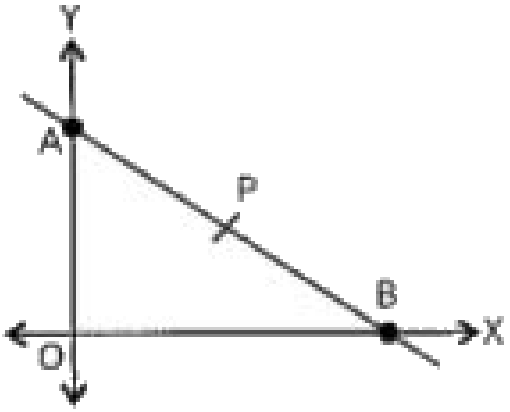
2. In the figure,



If P is the point $(-\cos\theta, \sin\theta)$, then find the length of OP, where O is the origin.

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3. Find the smallest 4-digit number which is divisible by 18, 24 and 32

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4. ABC is an isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$.

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5. State SAS similarity criterion.

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6. If a metalic cube of edge 1 cm is drawn into a wire of diameter 3.5 mm, then find the length of the wire.

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7. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

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8. If the n^{th} term of A.P. is $\frac{3+n}{4}$, then find the common different of A.P.

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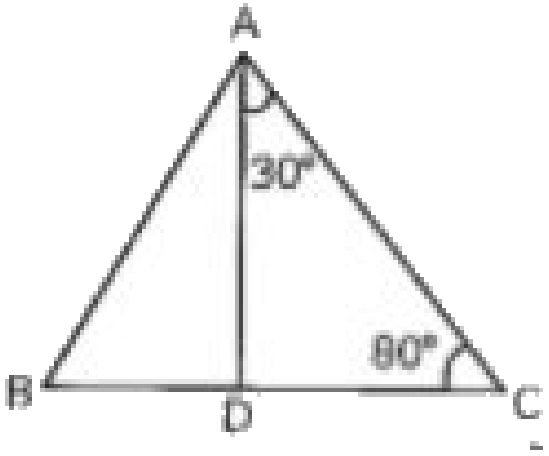
9. In the given figure, if $\frac{AB}{AC} = \frac{BD}{CD}$, then find the $\angle ABD$.



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10. If 3 secA-2cosB=$\sqrt{3}$ and $B = 30^\circ$, then find the value of A.

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11. If $\sin\theta + \sin^2\theta = 1$, prove that $\cos^2\theta + \cos^4\theta = 1$

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12. The perimeter of a rectangle is 82 m and its length is 30 m. find the breadth of the rectangle.

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13. The value of k for which the system of equations $x + 2y - 3 = 0$ and $5x + ky + 7 = 0$ has no solution, is (a) 10 (b) 6 (c) 3 (d) 1

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14. (1) $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

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15. Find the cooridnates of point A, where AB is a diameter of a circle whose centre is (3,-2) and B is the point (2,4).

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16. Find the distance between the points (0,3) and (4,0).

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17. What is the distance between two parallel tangents to a circle of radius 5 cm?

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18. Which term of the AP 21, 42, 63, 84,.. Is 210?

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19. Solve for x and y:

$x - y = 3$ and $x + 2y = 6$.

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

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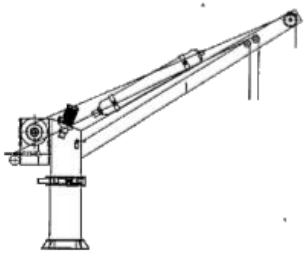
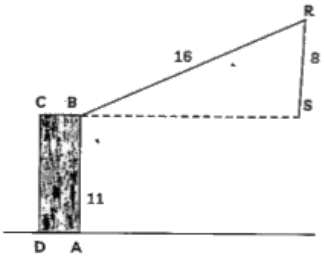
Part A Section Ii

1. A crane stands on a level ground. It is represented by a tower ABCD, of height 11 m and a jib BR. The ib is of length 20 m and can rotate in a vertical plane about B.A vertical cable, RS, carries a

load S. the diagram shows current position of the jib, cable and load.





The length BS is

A. 8 m

B. 12 m

C. 13.9 m

D. 17.9 m

Answer:

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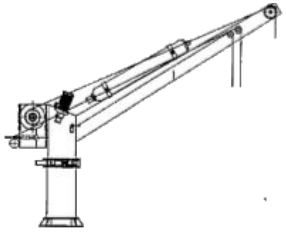
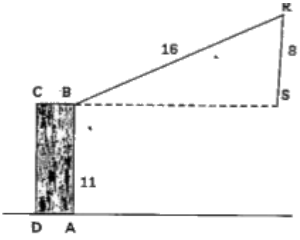
2. A crane stands on a level ground. It is represented by a tower ABCD of height 11 m and BR. The ib is of length 20 m and can rotate in a vertical plane about B.A vertical cable, RS, carries a load S. the diagram shows current position of the jib, cable and load.





The angle that the jib, BR, makes with the horizontal, is

A. 45°

B. 30°

C. 60°

D. 75°

Answer:

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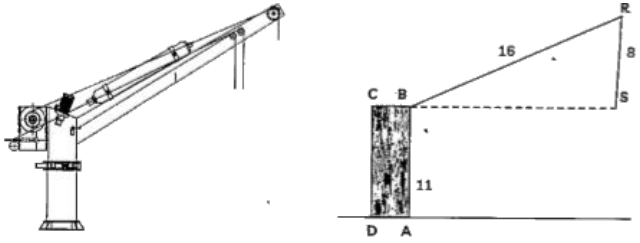
3. A crane stands on a level ground. It is represented by a tower ABCD, of height 11 m and a jib BR. The Jib is of length 20 m and can rotate in a vertical plane about B.A vertical cable, RS, carries a load S. the diagram shows current position of the jib, cable and load.



The measure of the angles BRS, is

A. 60°

B. 75°

C. 30°

D. 45°

Answer:

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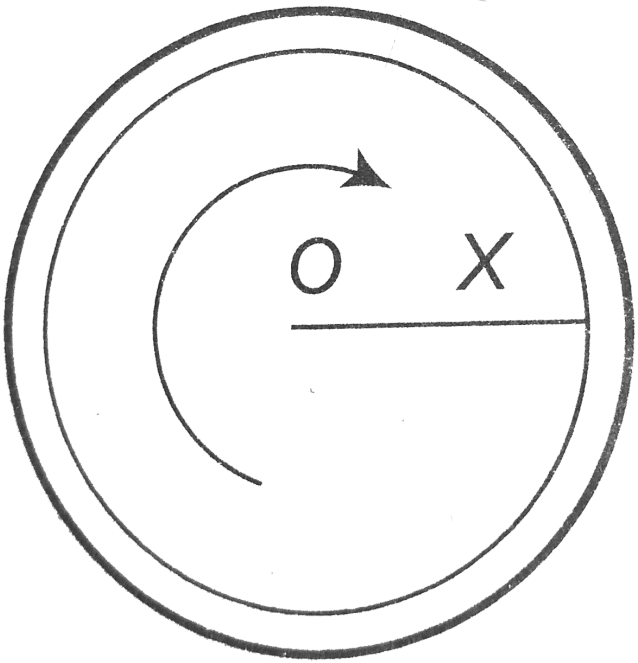

4.

The diagram shows a cup of tea seen from above. The tea has been stirred and is now rotating without turbulence. A graph showing the speed v with which the liquid is crossing points at a

distance X from O along a radius OX would took like

A. 15°

B. 25°

C. 30°

D. 45°

Answer:

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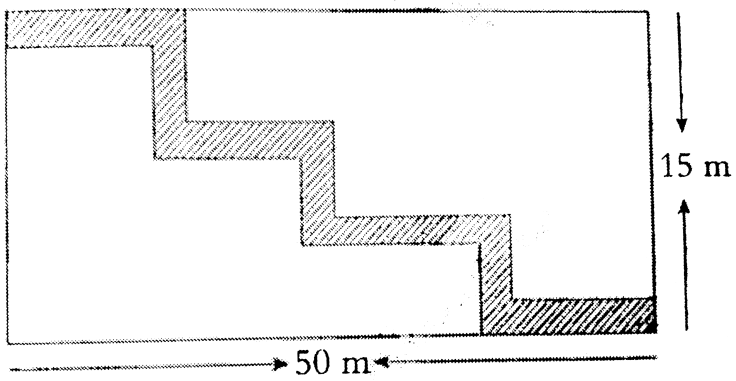
5. Find the total cost of levelling the shaded path of uniform which 2 m, laid in the rectangular field shown below, if the rate per m^2 is Rs. 100.



A. 14 m

B. 25 m

C. 17 m

D. 6 m

Answer:

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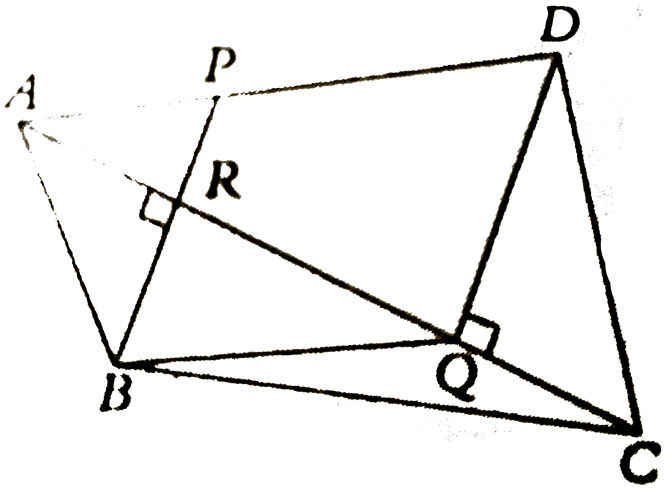

6.

In the figure given above, ABCD is a quadrilateral and BPDQ is parallelogram. AR = 50 cm, CQ = 70 cm, BR = 60, and PR = 40 cm. If the area of the quadrilateral ABCD is $15,600cm^2$, then find the

area of then find the area of the parallelogram BPDQ (in cm^2).

A. $r - 2$

B. $\sqrt{r^2 + 4^2}$

C. $r + 2$

D. $\sqrt{r^2 - 4}$

Answer:

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7. If $\sin 3\theta = \cos(\theta - 6^\circ)$, where 3θ and $(\theta - 6^\circ)$ are acute angle then the value of θ is _____.

A. 5 m

B. 6 m

C. 9 m

D. 12 m

Answer:

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8. If $y = \tan^{-1}(\sec x - \tan x)$, then differentiation of y wrt x is equal to= ?

A. 90°

B. 60°

C. 120°

D. 106°

Answer:

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9. If $\sin 3\theta = \cos(\theta - 2^\circ)$ where 3θ and $(\theta - 2^\circ)$ are acute angles, what is the value of θ?

A. 105 sq m

B. 108 sq m

C. 111 sq m

D. 124 sq m

Answer:

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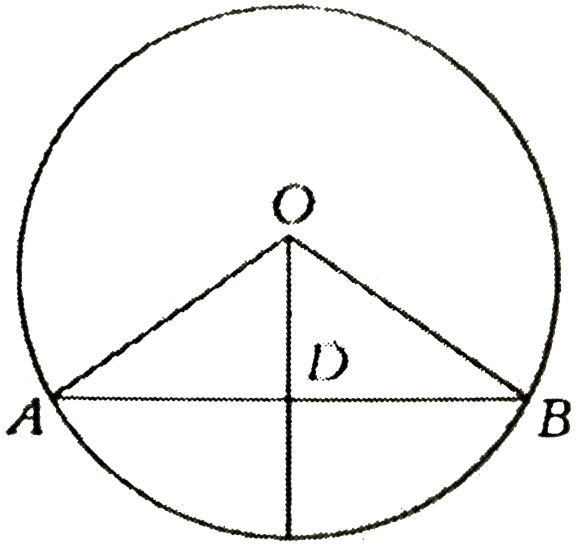
10. The perpenidicular drawn from the centre of a circle bisects any chord of the circle. The following are the steps involved in proving the above result. Arrange them in sequential order.



(A) Let $\overline{OD} \perp \overline{AB}$.

(B) Let AB be the chord of the circle with centre O.

(C) $\Delta ODA \equiv \Delta ODB$ (By RHS congruence

property).

(D) $OA = OB$ (radii), $OD = OD$ (common side) and $\angle ODA = \angle ODB = 90^\circ$

(E) $AD = DB$ (corresponding parts in congurents triangles).

A. 752 cu m

B. 805 cu m

C. 1016 cu m

D. 1214 cu m

Answer:

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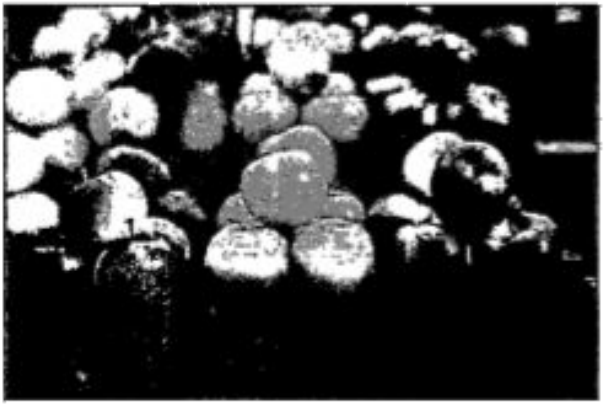
11. NITI aayog has tasked their statistical officer to create a model for farmers to be able to predict their produce output based on various factors.

To test the model out, the officer picked a local farmer who sells apples to check various factors like weight, bad apples, half-cooked, green vs red etc.

A box containing 250 apples was opened and each apple was weighed.



The distribution of the masses of the apples is given in the following table:

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

The value of p is

A. 50

B. 40

C. 35

D. 45

Answer:

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12. NITI aayog has tasked their statistical officer to create a model for farmers to be able to predict their produce output based on various factors.

To test the model out, the officer picked a local farmer who sells apples to check various factors like weight, bad apples, half-cooked, green vs red etc.

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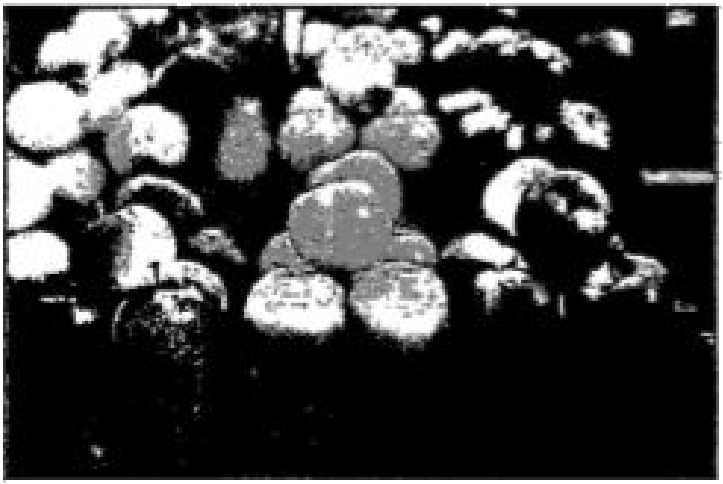

The distribution of the masses of the apples is given in the following table:

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

The lower limit of the modal class is

A. 80

B. 100

C. 120

D. 140

Answer:

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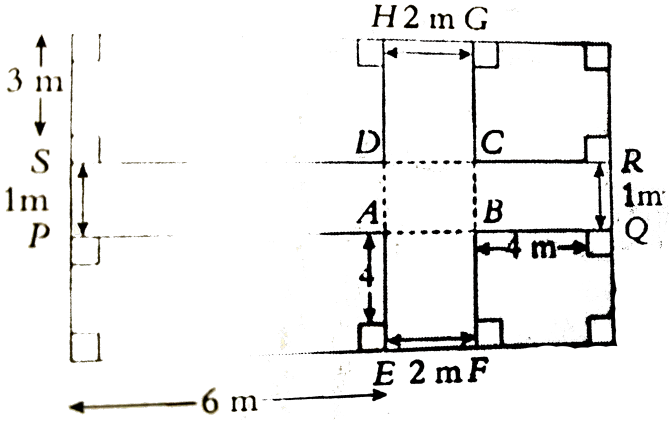
13. Find the area of the paths each having a uniform width in the following rectangular field.



A. 139 g

B. 142 g

C. 150 g

D. 156 g

Answer:

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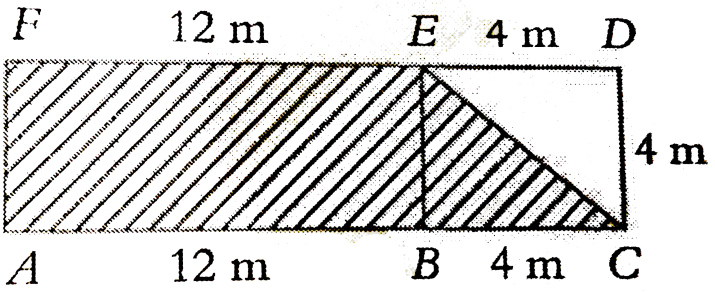
14.



Find the area of the shaded part in the figure given above.

A. 80

B. 100

C. 120

D. 140

Answer:

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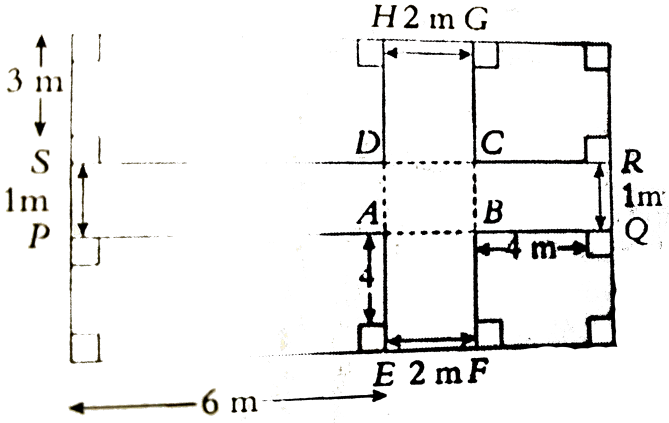
15. Find the area of the paths each having a uniform width in the following rectangular field.



A. 95 g

B. 125 g

C. 130 g

D. 132 g

Answer:

16. A bag contains three types of coins-rupee-coins. 50p-coins and 25 p-coins totalling 175 coins. If the total value of the coins of each kind be the same, the total amount in the bag Is

A. 0.01

B. 0.1

C. 0.02

D. 0.2

Answer:

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17. A piggy bank contains hundred 50p coins, fifty Rs. 1 coins, twenty ? 2 coins and ten Rs. 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin (i) will be a

A. 0.01

B. 0.1

C. 0.02

D. 0.2

Answer:

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18. Study the following information carefully and answer the given questions :

A word and number arrangement machine when

given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and steps of rearrangement :

Input : gone are take enough brought station

Step I : take gone are enough brought station

Step II : take are gone enough brought station

Step III : take are station gone enough brought

Step IV : take are station brought gone enough

And, Step IV is the last step for this input. Now find out appropriate step in each of the following questions following the above rule

Input : car on star quick demand fat.

What will be the third step for this input ?

1) star car quick demand on fat

2) star quick car demand on fat

3) star car demand quick on fat

4) star car quick on demand fat

5) None of these

A. 0.729

B. 0.81

C. 0.9

D. 0.271

Answer:

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19. A page from Girl's pass book is given below. He closed his account on $2-7-2007$. Assume that there were no transactions involving his account after $18-5-2007$.

Date	Particular	Withdrawn	Deposited	Balance
2-1-2007	B/F	–	–	4000
14-1-2007	By cash	–	5000	9000
14-2-2007	To self	3000	–	6000
7-4-2007	By cash	–	2000	8000
8-5-2007	To self	5500	–	2500
18-5-2007	By cash	–	6500	9000

Using the information as provided in the previous question, find out the amount received by Girl on closing his account (in Rs.) from January 2007-June 2007?

A. 0.729

B. 0.81

C. 0.9

D. 0.271

Answer:

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20. A page from Girl's pass book is given below. He closed his account on $2-7-2007$. Assume that there were no transactions involving his account

after $18 - 5 - 2007$.

Date	Particular	Withdrawn	Deposited	Balance
2-1-2007	B/F	–	–	4000
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7-4-2007	By cash	–	2000	8000
8-5-2007	To self	5500	–	2500
18-5-2007	By cash	–	6500	9000

Using the information as provided in the previous question, find out the amount received by Girl on closing his account (in Rs.) from January 2007-June 2007?

A. 0.72

B. 0.81

C. 0.9

D. 0.28

Answer:

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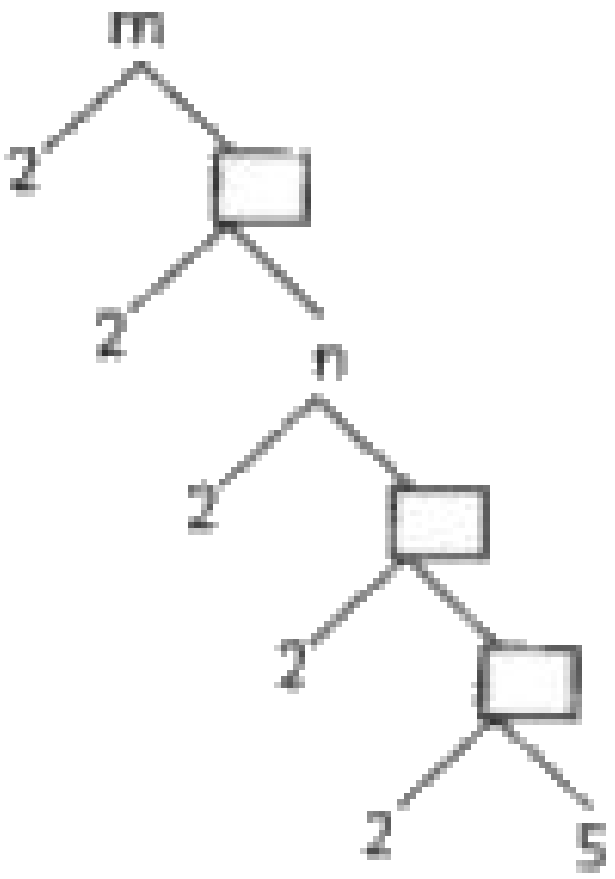
Part B Section Iii

1. In the adjoining factor tree, find the numbers m and n.



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2. Solve for x: $\frac{3^{2x-7}}{2} + 4 = \frac{35}{2}$

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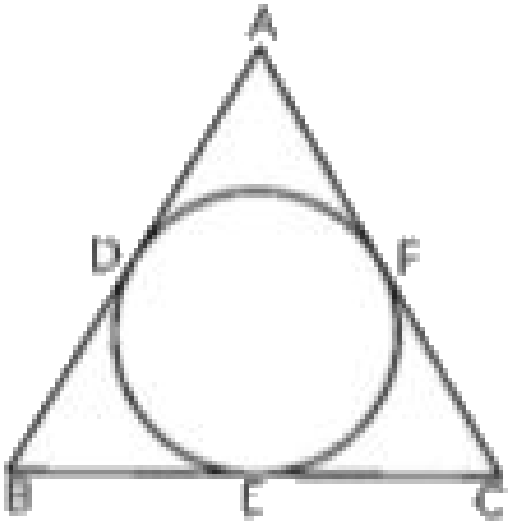
3. In the figure, if AB=AC, prove that: BE=EC



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4. If $\sin\theta = \frac{2}{3}$, find the positive value of:

$\sin\theta - \cot^2\theta + \cos ec^2\theta$

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5. Find the area and perimeter of a sheet of a paper which is a sector of a circle of radius 21 cm central angle 45°.

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6. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is

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7. The two opposite vertices of a square are $(1,\ 2)\ and\ (3,\ 2)$. Find the coordinates of the other two vertices.

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8. Find a relationship between x and y such that the point (x,y) is equidistant from the points (2,5) and (-1,4).

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Part B Section Iv

1. Find the largest number which divides 245 and 1029 leaving remainder 5 in each case.

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2. Solve for x : $x^4 - 20x^2 + 64 = 0$.

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3. Solve for x and y:

$$\frac{3a}{x} - \frac{2b}{y} + 5 = 0, \frac{a}{x} + \frac{3b}{y} - 2 = 0 (x \neq 0, y \neq 0)$$

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4. Prove that the area of an equilateral triangle described on a side of a right-angled isosceles triangle is half the area of the equilateral triangle described on its hypotenuse.

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5. From an external point P, two tangents PT and PS are drawn to a circle with centre O and radius r. if OP=2r, show that $\angle OTS = \angle OST = 30^\circ$

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6. If α and β are zeros of a quadratic polynomial $4x^2 + 4x + 1$, then find the quadratic polynomial whose zeros are $\alpha^2 + \beta^2$ and $2\alpha\beta$.

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7. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled?

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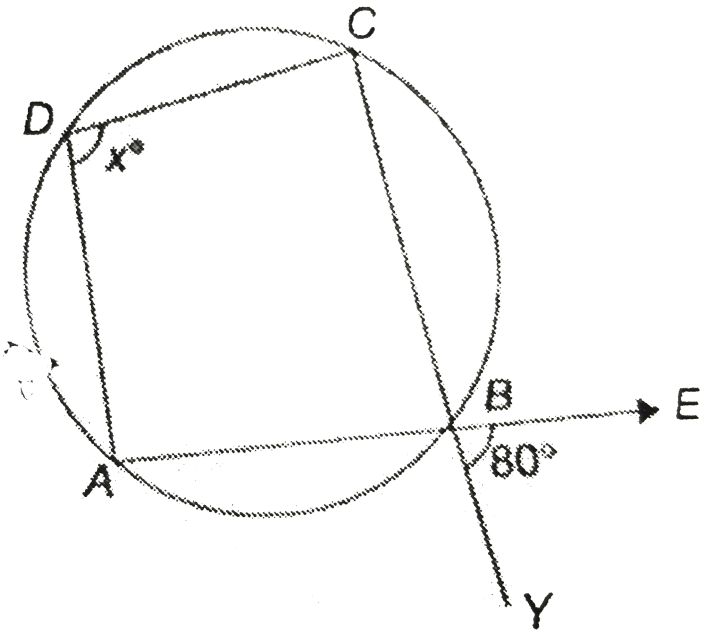
8. In Fig, find the value of x.



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9. How many terms of the AP: 9, 17, 25, . . . must be taken to give a sum of 636?

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Part B Section V

1. Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTQ = 2\angle OPQ$.

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2. 5 books and 7 pens together cost Rs 79 whereas 7 books and 5 pens together cost Rs 77. Find the

total cost of 1 book and 2 pens.

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3. The length of a rectangular plot is greater than thrice its breadth by 2 m. if the area of the plot is $120m^2$, find the dimensions of the plot.

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4. A tower is 50 m high. Its shadow is x metres shorter when the sun's altitude is 45° than when it is 30°. Find the value of x correct to nearest cm.

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