



## MATHS

### BOOKS - OSWAL PUBLICATION

### SAMPLE PAPER 6

#### Question Bank

1. Find the HCF of 52 and 320:

A. 16

B. 13

C. 4

D. 18

**Answer: C**



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2. If the points  $A(4, 3)$  and  $B(x, 5)$  lie on a circle with the centre  $O(2, 3)$ , find the value of  $x$ .

A. 2

B. 4

C. 6

D. 8

**Answer: A**

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3. When degree measure of angle centre is  $\theta$ , then what will be area of sector:

A.  $\sqrt{3a}$  cm

B.  $\frac{\theta}{180^\circ} \times \pi r$

C.  $\frac{\theta}{360^\circ} \times \pi r^2$

D.  $\frac{\theta}{180^\circ} \times 2\pi r$

**Answer: C**



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4. Find the value of  $\sin^2 60^\circ + \tan^2 45^\circ + \operatorname{cosec} 30^\circ \times \sec 60^\circ$ :

A. 1

B.  $\frac{16}{5}$

C. -1

D.  $\frac{23}{4}$

**Answer: D**



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5. If  $15 \cot A = 8$ , then find the value of  $\sec A$ :

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

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

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

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

**Answer: A**



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6. If  $x=A$  is a solution of the quadratic polynomial

$x^2 - x(A + B) + k = 0$ , then find the value of  $k$ :

A.  $A$

B.  $B$

C.  $AB$

D.  $A^2B^2$

**Answer: C**



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7. If the roots of polynomial  $x^2 - 3x + k = 0$  has equal roots, find the value of k:

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

B.  $\frac{9}{4}$

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

D.  $\frac{1}{6}$

**Answer: B**



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8. If the probability of winning a game is 0.995, then the probability of losing it is:

A. 0.05

B. 0.005

C. 0.5

D. 0.001

**Answer: B**



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9. In an isosceles  $\triangle ABC$  right angled at B, then:

A.  $AB^2 = 2AC^2$

B.  $AB^2 = AC^2$

C.  $AB^2 = \frac{AC^2}{4}$

D.  $AC^2 = 2AB^2$

**Answer: D**



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10. The value of  $\frac{\sec 30^\circ}{\cos 60^\circ}$  is:

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

B.  $\frac{\sqrt{3}}{2}$

C. 1

D. 0

**Answer: C**



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11. The roots of the quadratic polynomial  $x^2 - 5x + 6 = 0$  is:

A.  $-2, -3$

B.  $-2, 3$

C.  $3, -2$

D. 3, 2

**Answer: D**



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12. Find the length of the altitude of an equilateral triangle of side  $2a$  cm.

A.  $a$

B.  $\sqrt{3}a$

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

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

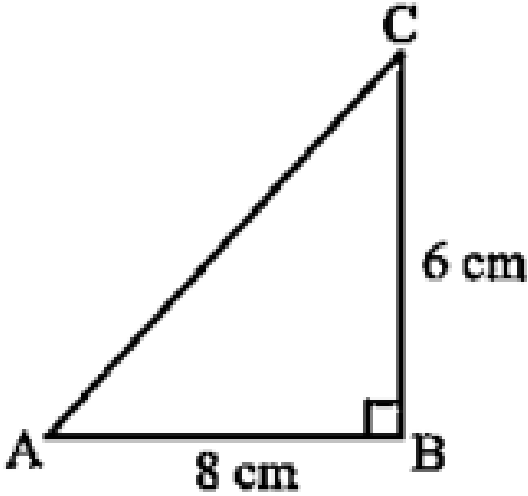
**Answer: B**



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13. In  $\triangle ABC$ ,  $\angle B = 90^\circ$ . Then  $\sin A + \cos C$  is:



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

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

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

D.  $\frac{1}{6}$

Answer: C



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14. The circumference of circle whose radius is 105 cm is \_\_\_\_\_

A. 660 cm

B. 110 cm

C. 650 cm

D. 440 cm

**Answer: A**



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15. What is the probability of a sure event?

A. 1

B. -1

C. 0

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

**Answer: A**



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16. If H.C.F. (a, b) = 12 and  $a \times b = 1800$ , then L.C.M. (a,b)=

A. 160

B. 150

C. 170

D. 180

**Answer: B**



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17. Find the coordinates of a point A, where AB is the diameter of a circle whose centre is (2,-3) and B is the point (1,4).

A. (2, 3)

B. (3, -10)

C. (1, -4)

D. (0, -6)

**Answer: B**



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**18.** What is the probability of an impossible event?

A. 1

B. -1

C. 0

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

**Answer: C**



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19. What is the value of  $\sin^2 45^\circ + \cos^2 45^\circ$  ?

$\sin^2 45^\circ + \cos^2 45^\circ$  का मान क्या है ?

A. 1

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

C.  $\sqrt{2}$

D. 0

**Answer: A**



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20. In the standard form of quadratic polynomial,

$Ax^2 + Bx + C$ ,  $A$ ,  $B$  and  $C$ :

A. all are real numbers

B. all are rational numbers

C. A is a non-zero real number and B and C are any real numbers

D. all are integers

**Answer: C**



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21. If the roots of the quadratic polynomial are equal, are the discriminant

$D = B^2 - 4AC$ , then:

A.  $D > 0$

B.  $D < 0$

C.  $D \geq 0$

D.  $D = 0$

**Answer: D**



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22. Which among the following cannot be the probability of an event?

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

B. 0.01

C. 10 %

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

**Answer: A**



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23. The radii of two concentric circles are 4 cm and 5 cm. The difference in the areas of these two circles is :

A.  $\pi$

B.  $4\pi$

C.  $8\pi$

D.  $9\pi$

**Answer: D**



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**24.** If one of the zeroes of the quadratic polynomial  $x^2 + 3x + k$  is 2, then find the value of k:

A. 10

B. -10

C. -8

D. 8

**Answer: B**



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**25.** If  $\sin \theta = \cos \theta$ , find the value of  $\theta$



A.  $90^\circ$

B.  $60^\circ$

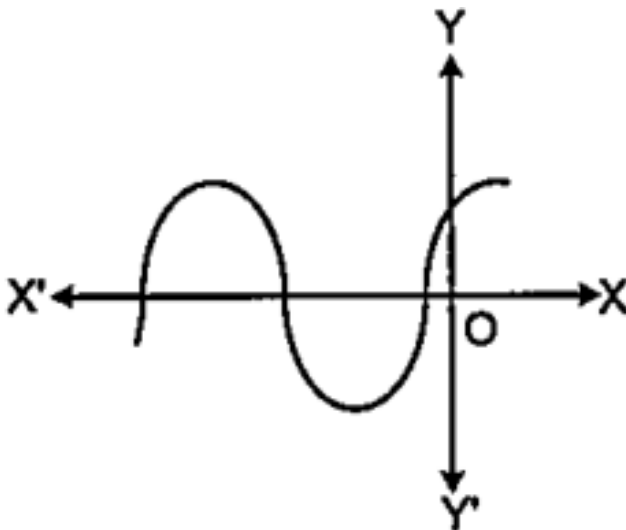
C.  $45^\circ$

D.  $30^\circ$

**Answer: C**

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**26.** Find the number of zeroes for a polynomial  $P(x)$  whose graph is given in figure



A. 3

B. 2

C. 1

D. 0

**Answer: A**



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27. If  $\alpha$  and  $\frac{1}{\alpha}$  are the zeroes of the quadratic polynomial  $2x^2 - x + 8k$ ,

then k is:

A. 4

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

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

D. 2

**Answer: B**

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28. If the sum of the roots is  $-p$  and product of the roots  $\frac{1}{p}$  is, then the quadratic polynomial is:

A.  $k \left( -px^2 + \frac{x}{p} + 1 \right)$

B.  $k \left( -px^2 + \frac{x}{p} - 1 \right)$

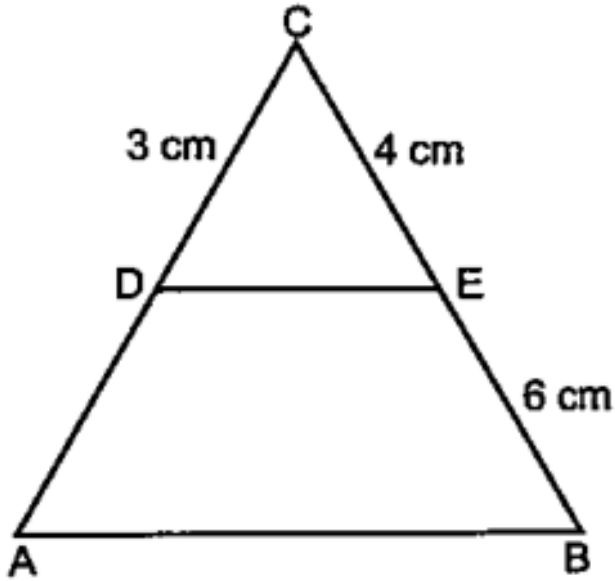
C.  $\left( x^2 + px - \frac{1}{p} \right)$

D.  $k \left( x^2 - px + \frac{x}{p} \right)$

**Answer: C**

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29. In  $\triangle ABC$ ,  $DE \parallel AB$ , If  $CD=3$  cm,  $EC=4$  cm,  $BE=6$  cm, then  $DA$  is equal to:



A. 7.5 cm

B. 3 cm

C. 4.5 cm

D. 6 cm

**Answer: C**

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30. In a rectangle, length=8 cm, breadth = 6cm. Then its diagonal is:

A. 9 cm

B. 14 cm

C. 10 cm

D. 12 cm

**Answer: C**



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**31.** Distance of the point  $(4, A)$  from X-axis is half its distance from Y-axis,  
then A=

A. 2

B. 8

C. 4

D. 6

**Answer: A**

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32. If  $\alpha$  and  $\frac{1}{\alpha}$  are the zeroes of the polynomial  $4x^2 - 2x + (k - 4)$ , then value of  $k$  is:

- A. 4
- B. 8
- C. 0
- D. None of these

**Answer: B**

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33. The graph of  $x^2 + 4 = 0$ :

- A. intersects X-axis at two distinct points
- B. touches X-axis at a point

C. neither touches nor intersects X-axis

D. either touches or intersects X-axis

**Answer: C**



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**34.** Which geometric figures are always similar?

A. circles

B. circles and all regular polygons

C. circle and triangles

D. Regular

**Answer: B**



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35. In  $\triangle PQR$ , length of the side  $QR$  is less than twice the length of the side  $PQ$  by 2 cm. Length of the side  $PR$  exceeds the length of the side  $PQ$  by 10 cm. The perimeter of 40 cm. The length of the smallest side of  $PQR$  is:

- A. 6 cm
- B. 8 cm
- C. 7 cm
- D. 10 cm

**Answer: B**



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36. Express in simplest form:  $\frac{\sin \theta}{\sqrt{1 - \sin^2 \theta}} =$

- A.  $\cot \theta$
- B.  $\sqrt{\sin \theta}$



C.  $\sin \theta / \sqrt{\cos \theta}$

D.  $\tan \theta$

**Answer: D**



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**37.** If the centroid of the triangle formed by points  $P(a, b)$ ,  $Q(b, c)$  and  $R(c, a)$  is at the origin, what is the value of  $a + b + c$ ?

A. 3

B. 2

C. 1

D. 0

**Answer: D**



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38. Solve:  $ax + by = a - b$ ,  $bx - ay = a + b$

A.  $x=1, y=2$

B.  $x=2, y=-1$

C.  $x=-2, y=-2$

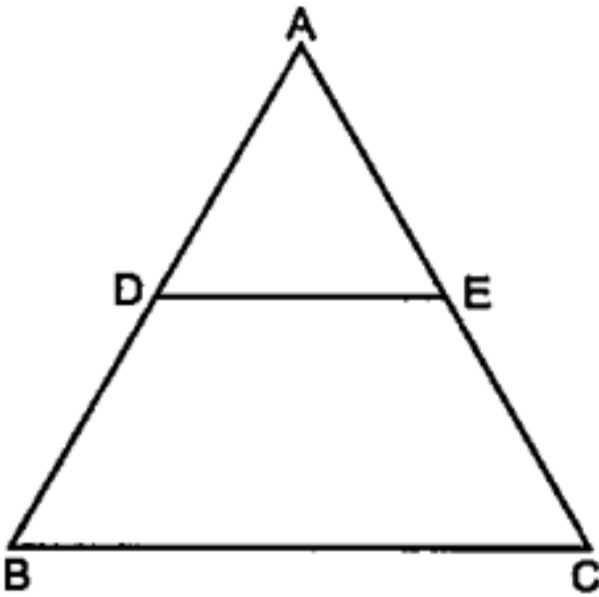
D.  $x=1, y=-1$

Answer: D



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39. In  $\triangle ABC$ , show in figure,  $DE \parallel BC$ . If  $BC=8$  cm,  $DE=6$  cm and area of  $\triangle ADE = 45\text{cm}^2$ , what is the area of  $\triangle ABC$ ?



- A.  $40 \text{ cm}^2$
- B.  $80 \text{ cm}^2$
- C.  $45 \text{ cm}^2$
- D.  $70 \text{ cm}^2$

**Answer: B**



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40. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

A. 45 cm

B. 36 cm

C. 42 cm

D. 64 cm

**Answer: C**



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41. Figure shows the arrangement of desks in a classroom Ashima, Bharti and Camella are seated at  $A(3, 1)$ ,  $B(6, 4)$  and  $C(8, 6)$  respectively. Do you think they are seated in a line? Give reasons for your answer.

A.  $(7, 6)$ ,  $(4, 5)$ ,  $(1, 2)$  and  $(4, 3)$

B. (1, 2), (4, 3), (7, 6) and (4, 5)

C. (4, 5), (7, 6), (4, 3) and (1, 2)

D. None of these

**Answer: C**



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**42.** In the following quadrilateral ABCD, the four mid-points P,Q,R,S are joined in such a way that the quadrilateral is divided into six parts.

The ratio of the quadrilaterals

$\square ASOP$ ,  $\square POQB$ ,  $\square ORCQ$ ,  $\square SDRO$  is 4:5:7:6 and the ratio of  $\triangle$

. If S is joined to R and P is joined to Q, find the ratio of

$\square PQRS$  and  $\square ABCD$ .

A.  $QR=SP$  and  $PQ=RS$

B.  $PQ=QR$  and  $RS=SP$

C.  $PQ$ ,  $QR$ ,  $RS$  and  $SP$  all are different

D. None of these

**Answer: A**

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**43.** In the following twenty questions, the 1<sup>st</sup> and the last part of the sentence/passage are numbered 1 and 6. The rest of the sentence/passage is split into four parts and named P, Q, R and S. These four parts are not given in their proper order. Read the sentences and find out which of the four combinations is correct and indicate it by blackening the appropriate circle in the Answer Sheet.

1. Grandpa had some old clothes.

P. But my mother took them out and kept them neatly folded in cupboard again.,br> Q. Sohe threw them into the waste basket.

R. So he put the clothing into the family.s bag of items to donate to charity.

S. My mother found them and put them back in his basket.

6. Grandpa finally put the items in my mother's mending basket and never saw them again.

A.  $\sqrt{10}$  and  $\sqrt{B}$  respectively

B. 2 and  $\sqrt{52}$  respectively

C.  $\sqrt{2}$  and  $\sqrt{10}$  respectively

D. None of these

**Answer: B**



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44. In the following quadrilateral ABCD, the four mid-points P, Q, R, S are joined in such a way that the quadrilateral is divided into six parts.

The ratio of the quadrilaterals

$\square ASOP$ ,  $\square POQB$ ,  $\square ORCQ$ ,  $\square SDRO$  is 4:5:7:6 and the ratio of  $\triangle$

. If S is joined to R and P is joined to Q, find the ratio of

$\square PQRS$  and  $\square ABCD$ .

A. a square

B. a rectangle

C. a parallelogram

D. a trapezium

**Answer: C**



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**45.** Study the following information carefully to answer the given questions :

Eight persons from different banks viz. UCO bank, Syndicate bank, Canara bank, PNB, Dena Bank, Oriental Bank of Commerce, Indian bank and Bank of Maharashtra are sitting in two parallel rows containing four people each, in such a way that there is an equal distance between adjacent persons. In row-1 A, B, C and D are seated and all of them are facing south. In row-2 P, Q, R and S are seated and all of them are facing north. Therefore, in the given seating arrangement each member seated in a



row faces another member of the other row. (All the information given above does not necessarily represent the order of seating as in the final arrangement)

C sits second to right of the person from Bank of Maharashtra. R is an immediate neighbour of the person who faces the person from Bank of Maharashtra.

Only one person sits between R and the person for PNB. Immediate neighbour of the person from PNB faces the person from Canara Bank.

The person from UCO bank faces the person from Oriental Bank of Commerce. R is not from Oriental Bank of Commerce. P is not from PNB. P does not face the person from Bank of Maharashtra.

Q faces the person from Dena bank. The one who faces S sits to the immediate left of A.

B does not sit at any of the extreme ends of the line. The person from Bank of Maharashtra does not face the person from Syndicate bank.

P is related to Dena bank in the same way as B is related to PNB based on the given arrangement. To who amongst the following is D related to, following the same pattern?

A.  $\frac{\sqrt{10}}{2}$  units

B.  $\frac{2\sqrt{10}}{5}$  units

C.  $3\sqrt{10}$  units

D.  $\frac{3\sqrt{10}}{5}$  units

**Answer: D**



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**46.** A and B start walking together from a point. Their steps measure 72 cm and 84 cm respectively. What is the minimum distance they should walk so that each takes exact number of steps?

A. 720 cm

B. 700 cm

C. 620 cm

D. 740 cm

**Answer: A**



47.  $S_1$  : Jaswant Singh of 4 Garhwal Rifles was apparently relaxing at 10,000 feet when he spotted a whole battalion of Chinese troops advancing towards an Indian Army post.

$S_6$  : Versions of the story vary.

P : They surrounded him, captured the three and beheaded them.

Q : Finally the enemy sent a scout party to ascertain the real strength of the Indian defence and they found just a rifleman and two girls.

R : After the war, the Chinese, impressed by the rifleman's valour, gave his head back to the Indian's who set up a temple for him.

S : With just one 303 and ammunition supplied by two girls from an abandoned dump, he mowed down about 50 enemy troopers.

Which one the following is the correct sequence ?

A. 20

B. 30

C. 35

D. 40

**Answer: B**



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**48.** In a race of 600 m, Anand beats Bharat by either 45 m or 9 s. Find the time taken by Anand and Bharat to finish the race

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

B.  $A \times B = LCM(A, B) \times HCF(A, B)$

C.  $A \times LCM(A, B) = B \times HCF(A, B)$

D. None of these

**Answer: B**



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**49. Case Study-2 :** Read the above paragraph and answer the following questions.

In a morning walk, Naveeka, Arjun and Vedant step off together, their steps measuring 240 cm, 90 cm, 120 cm respectively. They want to go for a juice shop for a health issue, which is situated near by them.

A largest positive integer that divides given two positive integers is called:

- A. HCF
- B. LCM
- C. co-prime
- D. None of these

**Answer: A**



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50.  $S_1$  : Jaswant Singh of 4 Garhwal Rifles was apparently relaxing at 10,000 feet when he spotted a whole battalion of Chinese troops advancing towards an Indian Army post.

$S_6$  : Versions of the story vary.

P : They surrounded him, captured the three and beheaded them.

Q : Finally the enemy sent a scout party to ascertain the real strength of the Indian defence and they found just a rifleman and two girls.

R : After the war, the Chinese, impressed by the rifleman's valour, gave his head back to the Indian's who set up a temple for him.

S : With just one 303 and ammunition supplied by two girls from an abandoned dump, he mowed down about 50 enemy troopers.

Which one the following is the correct sequence ?

A. tree

B. division

C. flower

D. None of these

**Answer: A**



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**51.** Find the HCF of 52 and 320:

A. 16

B. 13

C. 4

D. 18

**Answer: C**



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**52.** If the points  $A(4, 3)$  and  $B(x, 5)$  lie on the circle with centre  $O(2, 3)$ , then find the value of  $x$ :

A. 2

B. 4

C. 6

D. 8

**Answer: A**



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**53.** When degree measure of angle centre is  $\theta$ , then what will be area of sector:

A.  $\sqrt{3a}$  cm

B.  $\frac{\theta}{180^\circ} \times \pi r$

C.  $\frac{\theta}{360^\circ} \times \pi r^2$

D.  $\frac{\theta}{180^\circ} \times 2\pi r$

**Answer: C**



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54. Find the value of  $\sin^2 60^\circ + \tan^2 45^\circ + \csc 30^\circ \times \sec 60^\circ$ :

A. 1

B.  $\frac{16}{5}$

C. -1

D.  $\frac{23}{4}$

**Answer: D**

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55. If  $15 \cot A = 8$ , then find the value of  $\sec A$ :

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

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

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

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

**Answer: A**



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**56.** If  $x=a$  is a solution of the quadratic polynomial  $x^2 - x(a + b) + k = 0$ , then find the value of  $k$ :

A.  $a$

B.  $b$

C.  $ab$

D.  $a^2b^2$

**Answer: C**



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57. If the roots of polynomial  $x^2 - 3x + k = 0$  has equal roots, find the value of k:

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

B.  $\frac{9}{4}$

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

D.  $\frac{1}{6}$

**Answer: B**



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58. If the probability of winning a game is 0.0995, then the probability of losing it is:

A. 0.05

B. 0.0005

C. 0.5

D. 0.001

**Answer: B**



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**59.** In an isosceles  $\triangle ABC$  right angled at B, then:

A.  $AB^2 = 2AC^2$

B.  $AB^2 = AC^2$

C.  $AB^2 = \frac{AC^2}{4}$

D.  $AC^2 = 2AB^2$

**Answer: D**



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**60.** The value of  $\frac{\sec 30^\circ}{\cos 60^\circ}$  is:

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

B.  $\frac{\sqrt{3}}{2}$

C. 1

D. 0

**Answer: C**



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**61.** The roots of the quadratic polynomial  $x^2 - 5x + 6 = 0$  is:

A.  $-2, -3$

B.  $-2, 3$

C.  $3, -2$

D.  $3, 2$

**Answer: D**



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62. What will be the length of the altitude of an equilateral triangle of side  $2a$  cm?

A.  $a$

B.  $\sqrt{3}a$

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

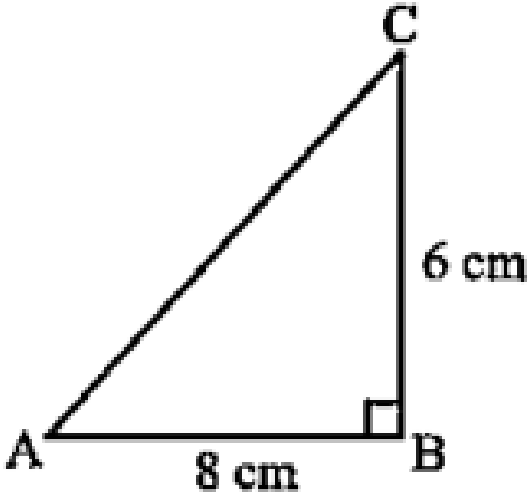
D.  $\frac{\sqrt{3}}{2}a$

**Answer: B**



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63. In  $\triangle ABC$ ,  $\angle B = 90^\circ$ . Then  $\sin A + \cos C$  is:



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

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

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

D.  $\frac{1}{6}$

Answer: C



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64. The circumference of circle whose radius is 105 cm is \_\_\_\_\_

A. 660 cm

B. 110 cm

C. 650 cm

D. 440 cm

**Answer: A**



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65. What is the probability of a certain event?

A. 1

B. -1

C. 0

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



**Answer: A**



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66. If H.C.F. (a, b) = 12 and  $a \times b = 1800$ , then L.C.M. (a,b)=

A. 160

B. 150

C. 170

D. 180

**Answer: B**



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67. What is the coordinates of A where AB is diameter of circle whose centre is (2, -3) and B is the point (1, 4):

A. (2, 3)

B. (3, -10)

C. (1, -4)

D. (0, -6)

**Answer: B**



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**68.** What is the probability of an impossible event?

A. 1

B. -1

C. 0

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

**Answer: C**



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69. The value of  $\sin^2 45^\circ + \cos^2 45^\circ$  is:

A. 1

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

C.  $\sqrt{2}$

D. 0

**Answer: A**



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70. In the standard form of quadratic polynomial,

$Ax^2 + Bx + C$ ,  $A$ ,  $B$  and  $C$ :

A. all are real numbers

B. all are rational numbers

C.  $a$  is a non-zero real number and  $B$  and  $C$  are any real numbers

D. all are integers

**Answer: C**

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71. If the roots of the quadratic polynomial are equal, are the discriminant

$D = B^2 - 4AC$ , then:

A.  $D > 0$

B.  $D < 0$

C.  $D \geq 0$

D.  $D = 0$

**Answer: D**

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72. Which among the following cannot be the probability of an event?

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

B. 0.01

C. 10 %

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

**Answer: A**



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73. The ratio of two concentric circles are 4 cm and 5 cm. Then, what is difference in areas of there are (in sq. units):

A.  $\pi$

B.  $4\pi$

C.  $8\pi$

D.  $9\pi$

**Answer: D**



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**74.** If one of the zeroes of the quadratic polynomial  $x^2 + 3x + k$  is 2, then find the value of  $k$ :

A. 10

B. -10

C. -8

D. 8

**Answer: B**



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**75.** If  $\sin \theta - \cos \theta = 0$ ,  $0 < \theta \leq 90^\circ$ , then the value of  $\theta$  is:

A.  $90^\circ$

B.  $60^\circ$

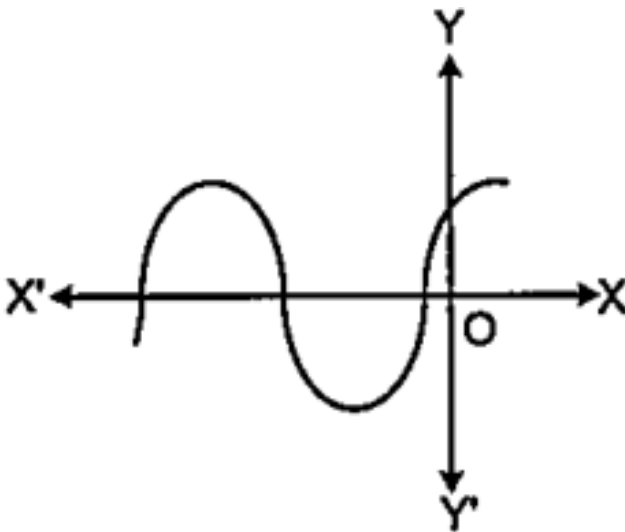
C.  $45^\circ$

D.  $30^\circ$

**Answer: C**

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76. Find the number of zeroes for a polynomial  $P(x)$  whose graph is given in figure



A. 3

B. 2

C. 1

D. 0

**Answer: A**



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77. If  $\alpha$  and  $\frac{1}{\alpha}$  are the zeroes of the quadratic polynomial  $2x^2 - x + 8k$ ,

then k is:

A. 4

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

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

D. 2

**Answer: B**



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78. If the sum of the roots is  $-p$  and product of the roots  $\frac{1}{p}$  is, then the quadratic polynomial is:

A.  $k \left( -px^2 + \frac{x}{p} + 1 \right)$

B.  $k \left( -px^2 + \frac{x}{p} - 1 \right)$

C.  $k \left( x^2 + px - \frac{x}{p} \right)$

D.  $k \left( x^2 + px + \frac{1}{p} \right)$

**Answer: C**

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79. In a rectangle, length=8 cm, breadth = 6cm. Then its diagonal is:

A. 9 cm

B. 14 cm

C. 10 cm

D. 12 cm

**Answer: C**



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**80.** Distance of the point  $(4, A)$  from X-axis is half its distance from Y-axis,

then  $A =$

A. 2

B. 8

C. 4

D. 6

**Answer: A**



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81. If  $\alpha$  and  $\frac{1}{\alpha}$  are the zeroes of the polynomial  $4x^2 - 2x + (k - 4)$ , then value of  $k$  is:

- A. 4
- B. 8
- C. 0
- D. None of these

**Answer: B**



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82. The graph of  $x + 4 = 0$ :

- A. intersects X-axis at two distinct points
- B. touches X-axis at a point
- C. neither touches nor intersects X-axis
- D. either touches or intersects X-axis

**Answer: C**



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**83.** Which geometric figures are always similar?

- A. circles
- B. circles and all regular polygons
- C. circle and triangles
- D. Regular

**Answer: B**



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**84.** In  $\triangle PQR$ , length of the side  $QR$  is less than twice the length of the side  $PQ$  by 2 cm. Length of the side  $PR$  exceeds the length of the side  $PQ$

by 10 cm. The perimeter of 40 cm. The length of the smallest side of  $PQR$

is:

A. 6 cm

B. 8 cm

C. 7 cm

D. 10 cm

**Answer: B**



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85. Express in simplest form:  $\frac{\sin \theta}{\sqrt{1 - \sin^2 \theta}} =$

A.  $\cot \theta$

B.  $\sqrt{\sin \theta}$

C.  $\sin \theta / \sqrt{\cos \theta}$

D.  $\tan \theta$

**Answer: D**



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**86.** If the centroid of triangle formed by point  $p(a, b)$ ,  $q(b, c)$  and  $r(c, a)$  is at the origin, what is the value of  $a+b+c$ ?

A. 3

B. 2

C. 1

D. 0

**Answer: D**



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**87.** What will be solution of the equations,  $ax+by=a-b$  and  $bx-ay=a+b$ ?

A.  $x=1, y=2$

B.  $x=2, y=-1$

C.  $x= -2, y= -2$

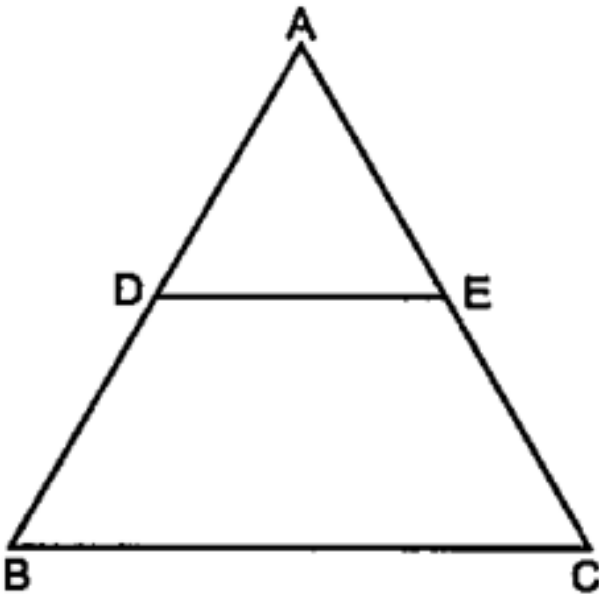
D.  $x=1, y=-1$

**Answer: D**



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**88.** In  $\triangle ABC$ , show in figure,  $DE \parallel BC$ . If  $BC=8$  cm,  $DE=6$  cm and area of  $\triangle ADE = 45\text{cm}^2$ , what is the area of  $\triangle ABC$ ?



- A.  $40 \text{ cm}^2$
- B.  $80 \text{ cm}^2$
- C.  $45 \text{ cm}^2$
- D.  $70 \text{ cm}^2$

**Answer: B**



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89. A vertical pole of length 6 m casts a shadow 4 m long on the ground at the same time a tower casts a shadow 28 m long what is the height of the tower?

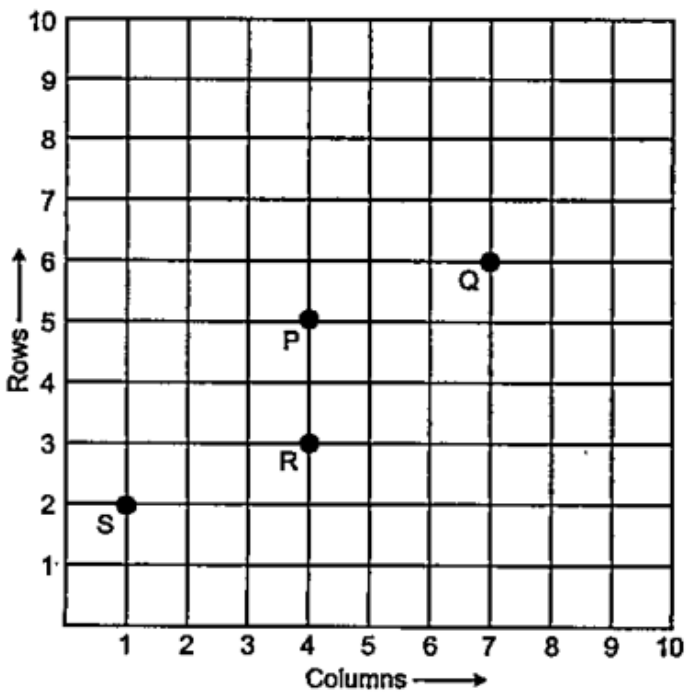
- A. 45 cm
- B. 36 cm
- C. 42 cm
- D. 64 cm

**Answer: C**



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90. Case Study-1 : Four students of a class are standing at points P, Q, R and S in rows and columns in their playground for a drill practice (as shown in figure).



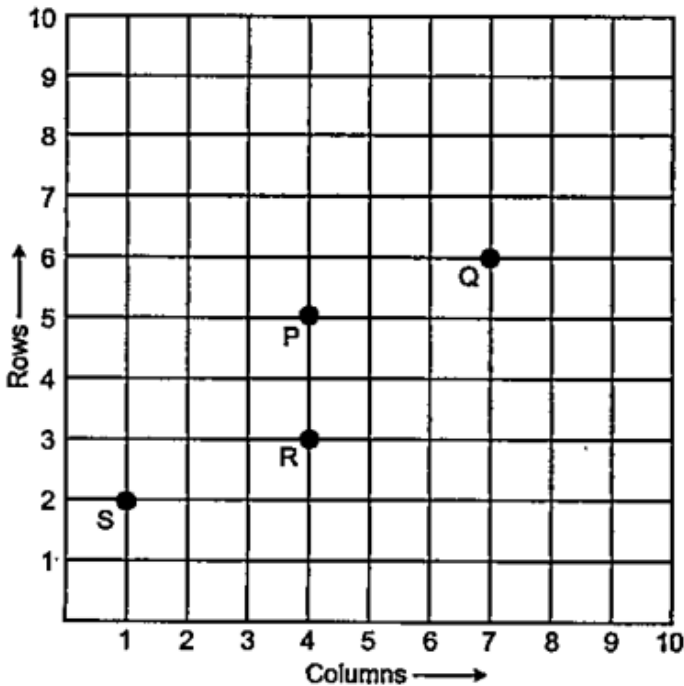
Based on the above figure answer the following questions: Find the coordinates of POINT PQRS

- A. (7, 6), (4, 5), (1, 2) and (4, 3)
- B. (1, 2), (4, 3), (7, 6) and (4, 5)
- C. (4, 5), (7, 6), (4, 3) and (1, 2)
- D. None of these

**Answer: C**



91. Case Study-1 : Four students of a class are standing at points P, Q, R and S in rows and columns in their playground for a drill practice (as shown in figure).



Based on the above figure answer the following questions:

When the points P, Q, R and S (in order) join together, it form a quadrilateral PQRS. The relation between the sides of quadrilateral PQRS is:

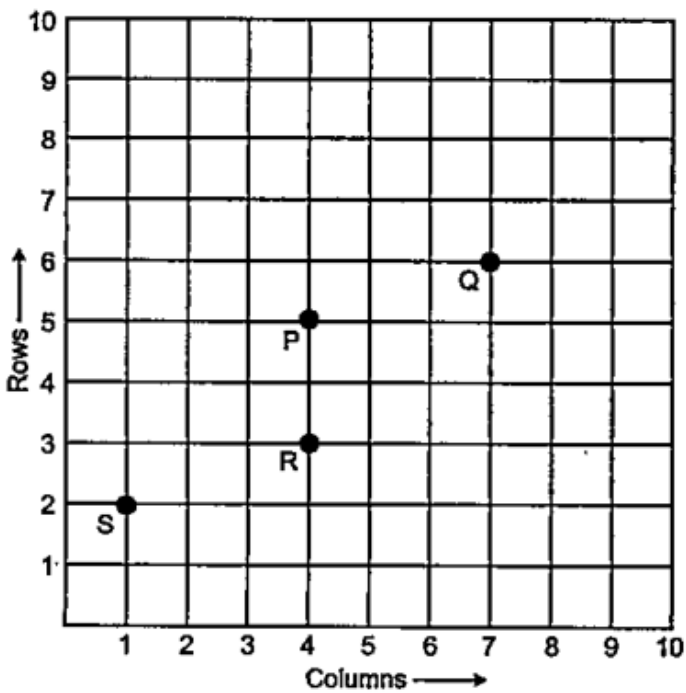
is:

- A.  $QR=SP$  and  $PQ=RS$
- B.  $PQ=QR$  and  $RS=SP$
- C.  $PQ$ ,  $QR$ ,  $RS$  and  $SP$  all are different
- D. None of these

**Answer: A**

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**92. Case Study-1 :** Four students of a class are standing at points P, Q, R and S in rows and columns in their playground for a drill practice (as shown in figure).



Based on the above figure answer the following questions:

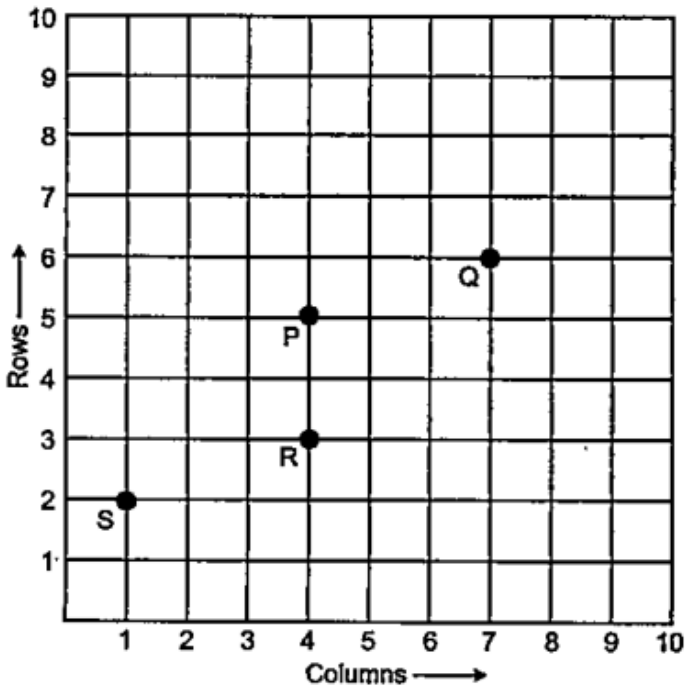
The length of the diagonals PR and QS are:

- A.  $\sqrt{10}$  and  $\sqrt{B}$  respectively
- B. 2 and  $\sqrt{52}$  respectively
- C.  $\sqrt{2}$  and  $\sqrt{10}$  respectively
- D. None of these

**Answer: B**



93. Case Study-1 : Four students of a class are standing at points P, Q, R and S in rows and columns in their playground for a drill practice (as shown in figure).



Based on the above figure answer the following questions:

The quadrilateral PQRS formed by these points is:

A. a square

B. a rectangle

C. a parallelogram

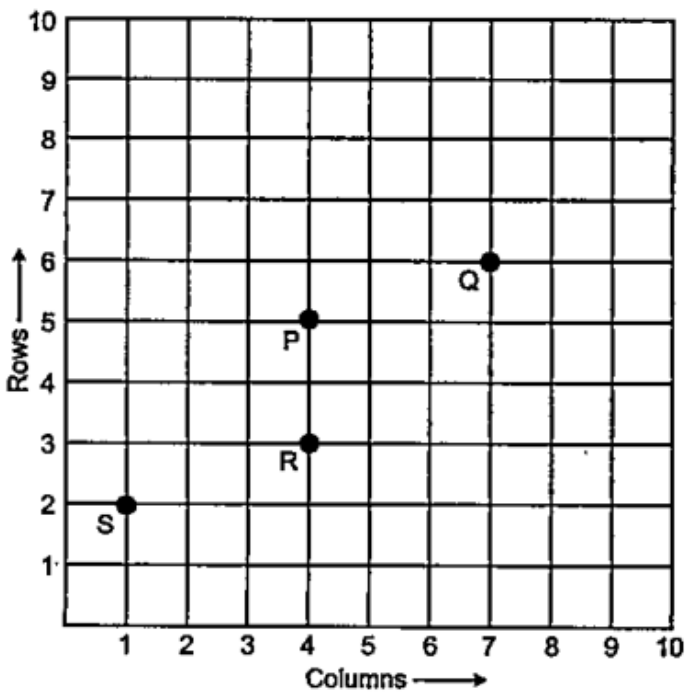
D. a trapezium

**Answer: C**



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**94. Case Study-1 :** Four students of a class are standing at points P, Q, R and S in rows and columns in their playground for a drill practice (as shown in figure).



Based on the above figure answer the following questions:

The height of the quadrilateral PQRS taking SR as the base is:

- A.  $\frac{\sqrt{10}}{2}$  units
- B.  $\frac{2\sqrt{10}}{5}$  units
- C.  $3\sqrt{10}$  units
- D.  $\frac{3\sqrt{10}}{5}$  units

**Answer: D**







**95.** Case Study-2 : Read the above paragraph and answer the following questions.

In a morning walk, Naveeka, Arjun and Vedant step off together, their steps measuring 240 cm, 90 cm, 120 cm respectively. They want to go for a juice shop for a health issue, which is situated near by them.

Find the minimum distance of shop from where they start to walk together, so that one can cover the distance in complete steps?

A. 720 cm

B. 700 cm

C. 620 cm

D. 740 cm

**Answer: A**

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**96. Case Study-2 :** Read the above paragraph and answer the following questions.

In a morning walk, Naveeka, Arjun and Vedant step off together, their steps measuring 240 cm, 90 cm, 120 cm respectively. They want to go for a juice shop for a health issue, which is situated near by them.

Find the common distance covered by all of them to reach the juice shop:

A. 20

B. 30

C. 35

D. 40

**Answer: B**



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**97. Case Study-2 :** Read the above paragraph and answer the following questions.

In a morning walk, Naveeka, Arjun and Vedant step off together, their

steps measuring 240 cm, 90 cm, 120 cm respectively. They want to go for a juice shop for a health issue, which is situated near by them.

If A and B are two numbers, then find the relation between LCM and HCF.

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

B.  $A \times B = LCM(A, B) \times HCF(A, B)$

C.  $A \times LCM(A, B) = B \times HCF(A, B)$

D. None of these

**Answer: B**



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**98. Case Study-2 :** Read the above paragraph and answer the following questions.

In a morning walk, Naveeka, Arjun and Vedant step off together, their steps measuring 240 cm, 90 cm, 120 cm respectively. They want to go for a juice shop for a health issue, which is situated near by them.

A largest positive integer that divides given two positive integers is called:

- A. HCF
- B. LCM
- C. co-prime
- D. None of these

**Answer: A**



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**99.** Case Study-2 : Read the above paragraph and answer the following questions.

In a morning walk, Naveeka, Arjun and Vedant step off together, their steps measuring 240 cm, 90 cm, 120 cm respectively. They want to go for a juice shop for a health issue, which is situated near by them.

Factor tree is a chain of factors, which is represented in the form of a:

A. tree

B. division

C. flower

D. None of these

**Answer: A**



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## Section A

1. If the roots of the equation  $(a^2 - bc)x^2 + 2(b^2 - ac)x + (c^2 - ab) = 0$  are equal, where  $b \neq 0$ , then find the relation between a, b and c.



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2. If 3 is a root of the equation  $kx^2 - kx - 3 = 0$ , find then the value of k



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3. The surface area of two spheres are in the ratio 16:9 .Find the ratio of their volumes.



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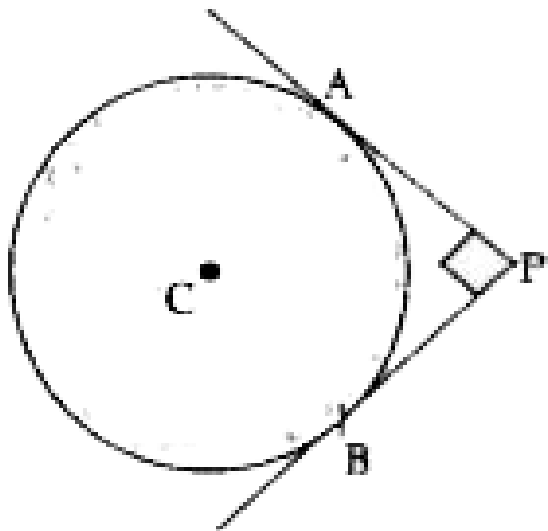
4. The sum of first 20 odd natural numbers is



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5. In figure ,PA and PB are two tangents drawn from an external point P to a circle with centre C and radius 4 cm .If  $Pa \perp PB$  ,then the length of

each tangent is :



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6. If the zeroes of the quadratic polynomial  $x^2 + (a + 1)x + b$  are 2 and -3, then

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1. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of  $60^\circ$  to each other.

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2. The following table gives the literacy rate (in percentage) of 35 cities.

Find the mean literacy rate.

Literacy rate (in %)	45 – 55	55 – 65	65 – 75	75 – 85	85 – 95
Number of cities	3	10	11	8	3

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3. The angle of elevation of an airplane from a point on the ground is  $60^\circ$ . After a flight of 30 seconds, the angle of elevation becomes  $30^\circ$ . If the airplane is flying at a constant height of  $3000\sqrt{3}$  m, find the speed of the airplane.

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4. A highway leads to the foot of 300 m high tower. An observatory is set at the top of the tower. It sees a car moving towards it at an angle of depression of  $30^\circ$ . After 15 seconds, angle of depression becomes  $60^\circ$ . Find the distance travelled by the car during this time.

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5. Mode of the following frequency distribution is 65 and sum of all the frequencies is 70. Find the missing frequencies  $x$  and  $y$ .

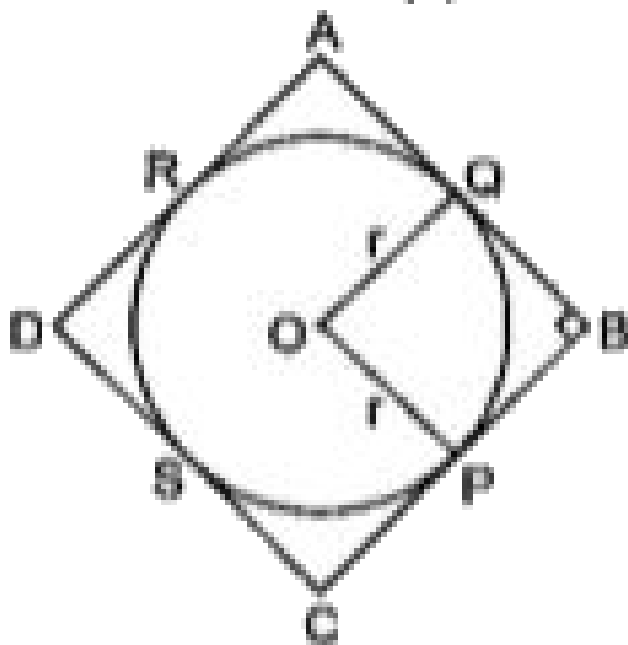
Class Interval	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120	120 - 140	140 - 160
Frequency	8	11	$x$	12	$y$	9	9	5

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## Section C

1. In the given figure, a circle is inscribed in a quadrilateral ABCD in which  $\angle B = 90^\circ$ . If  $AD = 23$  cm,  $AB = 29$  cm and  $DS = 5$  cm, find the value of

radius ( $r$ ).



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2. A well of diameter 4 m is dug 14 m deep. The earth taken out of it is spread evenly all around the well to form a 40-cm-high embankment. Find the width the embankment.

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3. A tent is in the form of a right circular cylinder of base radius 14 m and height 3 m is surmounted by a right circular cone of the same base radius. The total height of the tent is 13.5 m. Find the cost of the canvas used in making the tent at Rs80 per square meter and the cost of painting it at Rs 2 per square meter. [User  $\pi = \frac{22}{7}$ ]



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4. Treasure Hunt Games : While playing a treasure hunt game, some clues (numbers) are hidden in various spots collectively forms an AP. If the number of the  $n$ th spot is  $20+4n$ , then answer the following questions to help the player in spotting the clues.



Which number is on the  $(n - 2)^{th}$  spot?

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**5. Treasure Hunt Games :** While playing a treasure hunt game, some clues (numbers) are hidden in various spots collectively forms an AP. If the number of the  $n$ th spot is  $20+4n$ , then answer the following questions to help the player in spotting the clues.



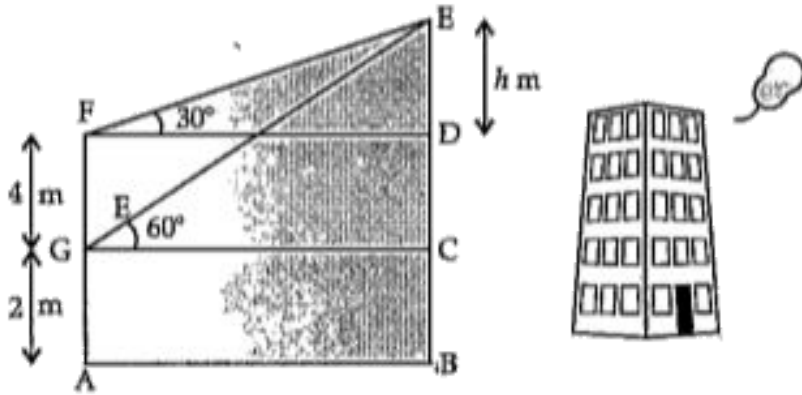
Which spot is numbered as 116 ?

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6. There are two windows in a house. First window is at the height of 2 m above the ground and other window is 4 m vertically above the lower window. Ankit and Radha are sitting inside the two windows at point G and F respectively. At an instant, the angle of elevation of a balloon from these windows are observed to be  $60^\circ$  and  $30^\circ$  as shown in the diagram :

Answer the following questions.

Find the value of DF

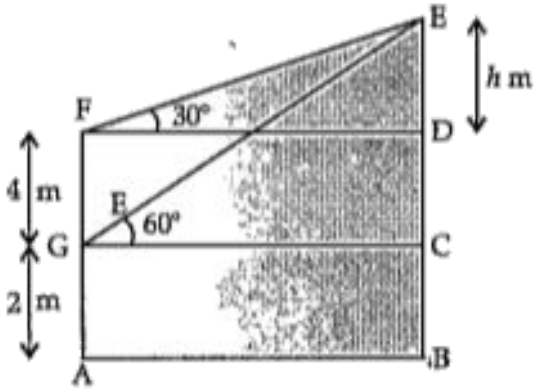


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7. There are two windows in a house. First window is at the height of 2 m above the ground and other window is 4 m vertically above the lower window. Ankit and Radha are sitting inside the two windows at point G and F respectively. At an instant, the angle of elevation of a balloon from these windows are observed to be  $60^\circ$  and  $30^\circ$  as shown in the diagram :

Answer the following questions.

What is the value of  $h$  in the given figure ?



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