MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 2

Section A

1. Write the discriminant of the quadratic equation

$(x+5)^2 = 2(5x-3)$.

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2. Find after how many places of decimal the decimal form of the number $\frac{27}{2^3.5^4.3^2}$ will terminate.

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3. Express 429 as a product of its prime factors.

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4. Find the sum of first 10 multiples of 6.

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5. Find the value (s) of x , if the distance between the points A(0,0) and B(x,-4) is 5 units.

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6. Two concentric circles of radii a and $b(a > b)$ are given. Find the length of the chord of the larger circle which touches the smaller circle.

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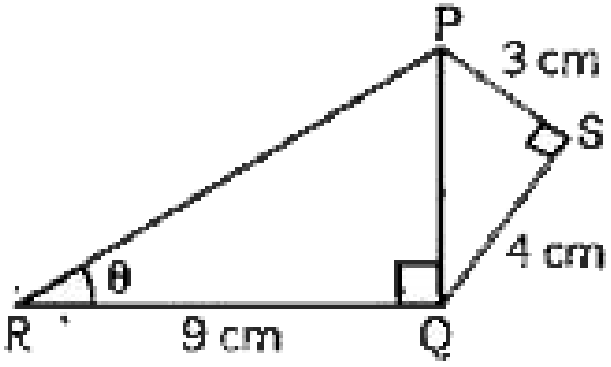
7. In Figure ,PS=3cm, QS=4 cm,

$\angle PRQ = \theta, \angle PSQ = 90^\circ, PQ \perp RQ$ and $RQ = 9$ cm . Evaluate $\tan\theta$.



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8. If $\tan\alpha = \frac{5}{12}$, find the value of $\sec\alpha$.

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9. Which of the following is a prime number ?

A. 11

B. 22

C. 33

D. 44

Answer: A

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10. Which of the following is a zero of the polynomial $x^3 - 8$?

A. -2

B. 2

C. 0

D. $\sqrt{8}$

Answer: B

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11. The roots of the equation $\sqrt{3}x^2 - 2x - \sqrt{3} = 0$ are :

A. $-\sqrt{3}, \frac{1}{\sqrt{3}}$

B. $2, 3$

C. $\frac{\sqrt{3}}{2}, -\frac{2}{\sqrt{3}}$

D. $\sqrt{3}, -\frac{1}{\sqrt{3}}$

Answer: D

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12. The 15^{th} term of the AP , $x-7, x-2, x+3$ is

A. $x+63$

B. x + 73

C. x + 83

D. x + 53

Answer: A

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13. If the points (a , 0) (0 , b) and (1 , 1) are collinear , then $\frac{1}{a}+\frac{1}{b}$ is :

A. -1

B. 1

C. 0

D. 2

Answer: B

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14. How many parallel tangents can a circle have ?

A. 1

B. 2

C. infinite

D. 0

Answer: B

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15. If $3\cos\theta = 1$, then cosec θ is equal to :

A. $2\sqrt{2}$

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

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

D. $\frac{4}{3\sqrt{2}}$

Answer: B

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16. The perimeter of a quadrant of a circle of radius 'r' is :

A. $\frac{\neq r}{2}$

B. $2\pi r$

C. $\frac{r}{2}[\pi + 4]$

D. $2\pi r + \frac{r}{2}$

Answer: C

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17. The probability of drawing a green coloured ball from a bag containing 6 red and 5 black balls is :

A. $\frac{6}{11}$

B. $\frac{5}{11}$

C. 1

D. 0

Answer: D

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18. A data has 25 observations arranged in a descending order. Which observation represents the median?

A. 12^{th}

B. 13^{th}

C. 14^{th}

D. 15^{th}

Answer: B

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Section B

1. Points A (3,1), B(5,1), C(a,b) and D (4,3) are vertices of a parallelogram ABCD .Find the values of a and b .

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2. Points P and Q trisect the line segment joining the points A (-2,0) a and B(0,8) such that ,P is near to A . Find the coordinates of points P and Q.

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3. Solve the pair of linear equations. $y - 4x = 1$ and $6x - 5y = 9$

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4. If HCF of 65 and 117 is expressible in the form $65m - 117$, then the value of m is

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5. On a morning walk ,three persons step out together and their steps measure 30 cm , 36 cm and 40 cm respectively .What is the minimum distance each should walk so that each can cover the same distance in complete steps?

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6. A die is thrown once .Find the probability of getting

(i) a composite number , (ii) a prime number.

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7. Using completing the square method ,show that the equation $x^2 - 8x + 18 = 0$ has no solution.

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8. Cards numbered 7 to 40 were put in a box . Poonam selects a card at random .What is the

probability that Poonam selects a card which is a multiple of 7 ?

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9. Are the points (0,5) , (0, -9) and (3,6) collinear ? Justify your answer .

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10. Find the zeroes of the polynomial $x^2 - 3$

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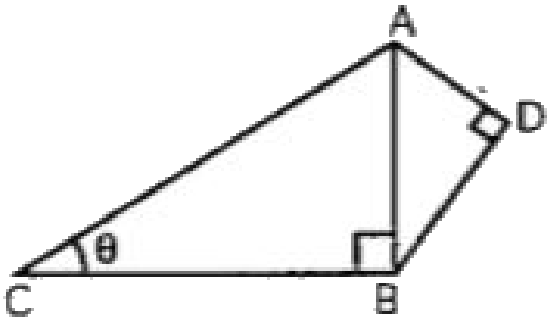
11. In the given figure AD = 4 cm BD = 3 cm and CB = 12 cm . Find the value of cot θ



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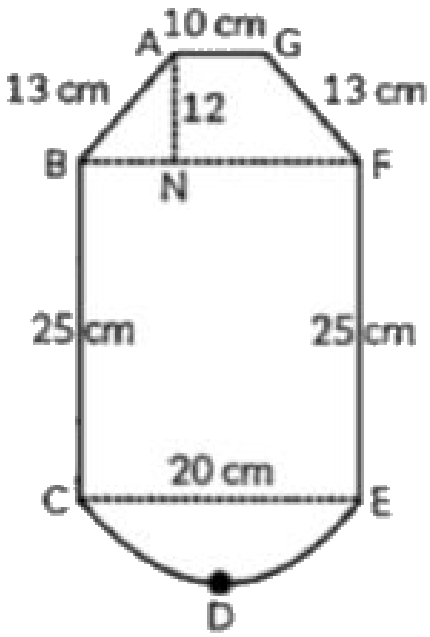
12. The figure shows the cross-section of the interior of thermos flask .



The top part is a trapezium , the middle part is a rectangle and the bottom part is a semicircle if CE = 20 cm , BC = 25 cm , AB = GF = 13 cm , AG = 10 cm and AN = 12 cm , the find :

The perimeter of the cross-section

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13. Area of a sector of a circle of radius 36 cm is $54\pi cm^2$. Find the length of the corresponding arc of sector.

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14. Write the prime factorisation of 8190

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15. Find the HCF of 2205 , 5145 and 4410

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Section C

1. The perpendicular from A on side BC of a ΔABC meets BC at D such that DB = 3CD .Prove that $2AB^2 = 2AC^2 + BC^2$.

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2. If AD and PM are medians of triangles ABC and PQR, respectively where$\Delta ABC\Delta PQR$, prove that $\frac{AB}{PQ} = \frac{AD}{PM}$

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3. Check whether g(x) is a factor of p(x) by dividing polynomial p(x) by polynomial g(x), where $p(x) = x^5 - 4x^3 + x^2 + 3x + 1, g(x) = x^3 - 3x + 1$.

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4. Find the area of the triangle formed by joining the mid -points of the sides of the triangle ABC ,whose vertices are A(0,-1),B(2,1)andC(0,3).

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5. Find the values of x and y which satisfy both the equations:

x-y=11 and 4x+y=14.

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

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7. Find the greatest number which an dividing 1251 , 9377 and 15628 leaves remainders 1,2 and 3

respectively .

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8. (i) A,B and C are interior angles of a triangle ABC.Show that $\sin\left(\frac{B+C}{2}\right) = \cos\left(\frac{A}{2}\right)$.

(ii) If $\angle A = 90^\circ$, then find the value of $\tan\left(\frac{B+C}{2}\right)$.

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9. If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \frac{1}{\sqrt{3}}, 0^\circ < A+B \leq 90^\circ, A > B,$

then find the value of A and B.

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10. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.

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11. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

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12. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

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13. A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent.

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14. A car has two wipers which do not overlap. Each wiper has a blade of length 21 cm, sweeping through an angle of 120°. Find the total area cleaned at each sweep of the blades.

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15. If Q(0, 1) is equidistant from $P(5,\ 3)$and R(x, 6), find the values of x. Also find the distances QR and PR.

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16. The sum of two numbers as well as the difference between their squares is 9 . Find the numbers .

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17. Prove that $2\sqrt{3}-4$ is an irrational number , using the fact that $\sqrt{3}$ is an irrational number .

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18. Find the HCF and LCM of 15 , 18 and 45 , by the prime factorisation method .

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19. The length of the minute hand of a clock is 14 cm . Find the area swept by the minute hand in 15 minutes .

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20. The radii of the two circles are 4 cm and 3 cm . Find the radius of the circle whose area is equal to the sum of the areas of the two circles . Also , find the circumference of the circle .

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21. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

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22. Draw a circle of radius 3.5 cm . Take a point P outside the circle at a distance of 7 cm from the centre of the circle and construct a pair of tangents to the circle from the point.

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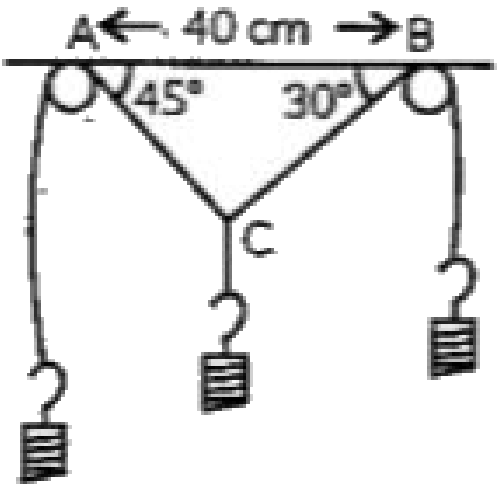
23. If AB = 40 cm , $\angle CAB = 45^\circ$ and $\angle CBA = 30^\circ$



Find

(i) the length of AC

(ii) the length of BC .

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24. Prove that the line segments joining the mid-points of the sides of a triangle from four triangles, each of which is similar to the original triangle.

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25. Find the mean marks from the following frequency distribution

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
Number of students	2	5	16	20	30

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Section D

1. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible t

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2. If m time the m^{th} term of an Arithmetic Progression is equal to n times its n^{th} term and

$m \neq n$,show that the $(m+n)^{th}$ term of the AP is zero .

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3. The sum of the first three numbers in an Arithmetic Progression is 18. If the product of the first and the third term is 5 times the common difference, find the three numbers.

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4. Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

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5. The decorative block is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block.

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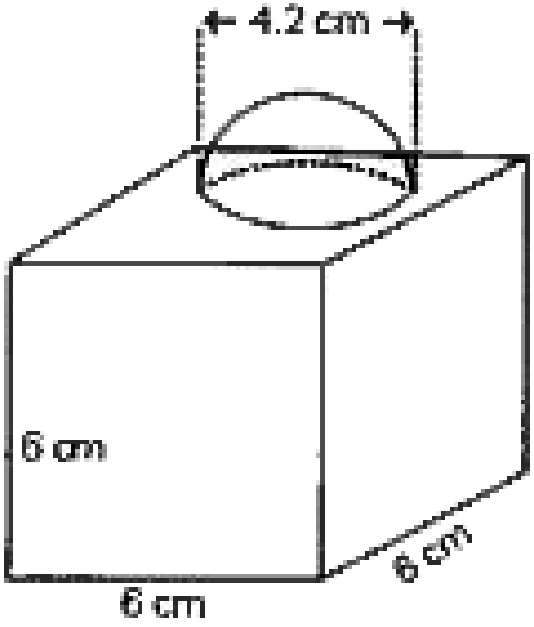
6. In Figure a decorative block is shown which is made of two solids , a cube and a hemisphere .The base of the block is cube with edge 6 cm and the hemisphere fixed on the top has a diameter of 4.2 cm .Find :



the volume of the block formed `

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7. A bucket is in form of a frustum of a cone with a copacity of $12308.8cm^3$of water. The radii of the

tope bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of the metal sheet used in its making. [Use $\pi = 3.14$.]

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8. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

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

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10. If $1 + \sin^2 \beta = 3 \sin \beta . \cos \beta$, then prove that $\tan \alpha = 1$ or $\tan \alpha = \frac{1}{2}$.

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11. For what values of x does the equation hold true?

$2^{4x^2+5x-2} = 16$

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12. The shadow of a tower standing on a level ground is found to be 40 m longer when the Suns altitude is $30o$than when it is $60o$. Find the height of the tower.

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13. Find two consecutive odd positive integers, sum of whose squares is 290.

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14. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 45°. If the tower is 30 m high, find the height of the building.

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15. If $\tan\theta + \sin\theta = mandtan\theta - \sin\theta = n,$ show that $m^2 - n^2 4\sqrt{mm}$

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16. The 6^{th} term of an AP is five times the 1^{st} term and the 11^{th} term exceeds twice the 5^{th} term by 3 . Find the 8^{th} term of the AP .

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17. Solve for x , using the quadratic formula :

$$x - \frac{1}{x} = 3$$

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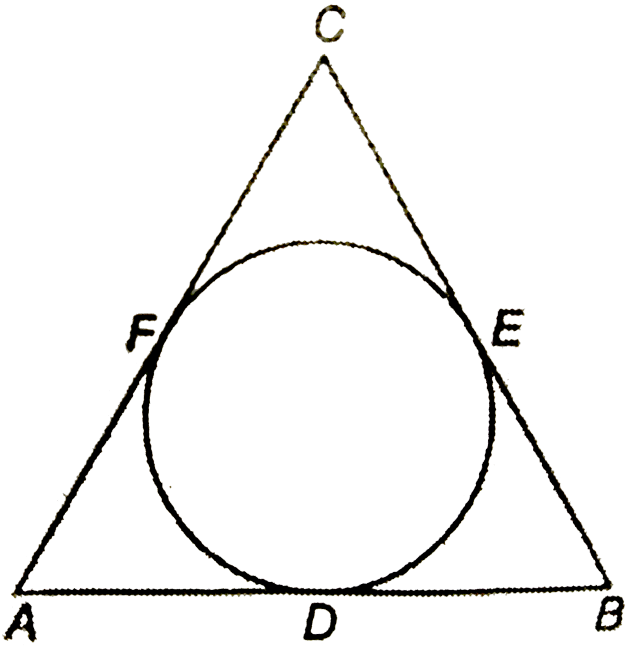
18. A circle is inscribed in a $\triangle ABC$ having sides 8 cm, 10 cm and 12 cm as shown in figure. Find AD, BE and CF.



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19. In a quadrilateral ABCD, $\angle A + \angle D = 90^\circ$. Prove that

$$AC^2 + BD^2 = AD^2 + BC^2$$

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20. In Fig. 4.123, ABCD is a trapezium with $AB \| DC$. If ΔAED is similar to ΔBEC, prove that $AD = BC$.

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21. A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied out on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the radius and slant height of the heap.

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Section A Fill In The Blanks

1. The next term of AP , 3 $3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}$. is _____ .

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2. The maximum value of $\frac{1}{\cos ec\theta}$ is

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3. The median of the first 50 even natural numbers is _____

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4. If $x_i's$ are the mid-points of the class intervals of grouped data, $f_i's$ are the corresponding

frequencies and $\bar{x}$ is the mean, then $\sum (f_i x_i - \bar{x})$ equal to

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5. When a die is thrown the probability of getting an odd number greater than 5 is ____

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Section A Short Answer Type Question

1. Find cosec A , if tan $A = \frac{1}{\sqrt{3}}$

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2. Find the mean of the following data :

54, 62 , 69 , 45 , 23 , 48 , 76 , 25 , 36 , 62

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3. A card is drawn at random from a pack of 52 playing cards . Determine the probability of it being a red king card .

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4. Determine the number of zeroes of the polynomial $x^4 - 1$

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5. Find the value of 'k' so that the following pair of linear equation has infinite number of solutions :

$2x - 3y + 6 = 0, 3x + ky + 9 = 0$

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6. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0,$ then find the value of k.

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