MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER -6

Part A Section I

1. Write the denominator of the rational number $\frac{771}{3000}$ in the form $2^p 5^q$, where p and q are non - negative integers

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2. If two positive integers m and n are expressible as as $m = ab^2$ and $n = a^3b$, where a and b are prime numbers, then find LCM (m, n)

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3. Find the value of the remainder, when $x^2 + (a + b)x + ab$ is divided by (x + a)

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4. If the sum of a positive number and its square is 240 , then find the number

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5. If x, x - 2 and 3x are in AP, then find the value of x

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6. Determine the 12^{th} term of the AP, 5, 8, 11, 14, ...

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7. The sum and the product of the roots of the quadratic equations $2x^2 + 14x + 24 = 0$

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8. Solve for x and y, x + y = 2, x - y = 1

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9. Find the ratio in which x - axis divides the join of A(2, - 3) and B(5, 6)

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10. The distance between the points $(a\cos\theta + b\sin\theta, 0)$ and $(0, a\sin\theta - b\cos\theta)$.

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11. Plotting the points A (- 4, 6) and B (- 4, -6) on the coordinate axes check if P (- 4, 2) lies on the line segment AB

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12. Check if the three sides of lengths 3 cm 6 cm and 8 cm can form a right triangle

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13. Find the length of a altitude in on equilateral triangle of side 'a' cm

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14. Pythagoras theorem

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15. From the external point P tangents PA and PB are drawn to a circle with centre O. If

$\angle PAB = 50^\circ$, then find $\angle AOB$.

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16. Simplify $\left(1 + \tan^2\theta\right)(1 + \sin\theta)(1 - \sin\theta)$

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17. If $3\sec\theta = 5$, then find the value of $\cot\theta$

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18. Find the total surface area of a wooden right circular cylinder of base radius 'r' and height 'h'

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19. If the area of a circle is $154cm^2$, then find its circumference

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20. The median and modal classes of the following data :

x	0-10	10-20	20-30	30-40	40-50	50-60
f	5	3	4	3	6	12

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21. Two unbiased coins are tossed simultaneously, then the probability then the probability of getting no head is $\frac{p}{q}$. Find the value of $(p+q)^2$

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Part A Section Ii

1. A triangular field BAD, right angled at A has $AB = 180m$ and $\angle DBA = 30^\circ$. The length AD is

A. $29\sqrt{3}$

B. $38\sqrt{3}m$

C. $43\sqrt{3}$ m

D. $60\sqrt{3}m$

Answer: D

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2. A triangular field ABC, right angled at A has length $AC = 33m$ and $AB = 180m$. The length of the side BC is

A. 193 m

B. 189 m

C. 188 m

D. 183 m

Answer: D

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3. A triangular field right angled at A has length $AC = 33m$ and $AB = 180m$. The area (in sq m) of the field ABC is

A. 2790 sq m

B. 2970 sq m

C. 3102 sq m

D. 3210 sq m

Answer: B

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4. A path 2m wide is built along the boarder inside a square garden of side 30m. Find (i) area of the path (ii) the cost of planting the grass in the remaining portion of the garden at the rate of 40 per m^2.

A. 32 . 5 m

B. 36 . 6 m

C. 28 . 8 m

D. 40 . 2 m

Answer: A

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5. A triangular field BAD, right angled at A has $AB = 180m$ and $\angle DBA = 30^\circ$. The length BD is

A. 198 m

B. 208 m

C. 228 m

D. 243 m

Answer: B

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6. A heating coil of $2000W$ is immersed in water . How much time will it take in raising the temperature of $1L$ of water from $4^\circ C\text{to}100^\circ C$? Only $80\,\%$ of the thermal

energy produced is used in raising the temperature of water.

A. 60°

B. 75°

C. 120°

D. 135°

Answer: C

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

A. 5.2

B. 10.4

C. 15.6

D. 20.8

Answer: C

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8. The central angle of a sector is 240° and radius is 12 cm, then the area (in sq cm) of the sector is

A. 26π

B. 24π

C. 20π

D. 18π

Answer: B

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9. O is the centre of a circle with radius 5 cm. LM is the diameter of the circle. P is a point on the plane of the circle such that LP = 6 cm and MP = 8 cm. Then P lies.

A. 1584

B. 1680

C. 1507

D. 1820

Answer: C

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10. A 20 cm long cylindrical vessel has a radius of 8 cm. The total surface area (in sq cm) of the cylindrical vessel is

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11.

Number of letters	2	3	4	5	6	7
Frequency	1	4	5	3	5	2

A person chooses a word at random. What is the probability that it is a 4 - letter word?

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

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

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

D. $\frac{1}{10}$

Answer: A

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12.

Number of letters	2	3	4	5	6	7
Frequency	1	4	5	3	5	2

A person chooses a word at random. What is the probability that it has odd number of letters?

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

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

C. $\frac{9}{20}$

D. $\frac{1}{3}$

Answer: C

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13.

Number of letters	2	3	4	5	6	7
Frequency	1	4	5	3	5	2

A person chooses a word at random. What is the probability that it is a 6 - letter word?

A. $\frac{1}{20}$

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

C. $\frac{5}{20}$

D. $\frac{1}{40}$

Answer: B

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14.

Number of letters	2	3	4	5	6	7
Frequency	1	4	5	3	5	2

A person chooses a word at random. What is the probability that it is a 2 - letter word?

A. $\frac{1}{20}$

B. $\frac{1}{80}$

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

D. $\frac{1}{40}$

Answer: A

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15.

Number of letters	2	3	4	5	6	7
Frequency	1	4	5	3	5	2

The mean number of letters is

A. 4.65

B. 4.56

C. 5.46

D. 5.64

Answer: A

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16. If $P(x, y)$ is equidistant from $A(1, 6)$ and $B(4, 1)$, then the relation between x and y is:

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17. The distance of the $B(6, 6)$ from the origin is:

A. $\sqrt{53}$ units

B. $\sqrt{41}$ units

C. $\sqrt{72}$ units

D. $\sqrt{145}$ units

Answer: C

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18. The co-ordinates of the third vertex C on the x-axis so that $A(2, 0)$, $B\left(2 + 2\sqrt{3}, 6\right)$ and C form an equilateral triangle is :

A. (,4)

B. (1,5)

C. (2,3)

D. (5,1)

Answer: B

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19. The distance between $A(2, 7)$ and $C(5, 4)$ is

A. $\sqrt{18}$ units

B. $\sqrt{17}$ units

C. $\sqrt{5}$ units

D. $\sqrt{34}$ units

Answer: A

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20. The distance between $B(6, 6)$ and $D(3, 2)$ is

A. $\sqrt{24}$ units

B. $\sqrt{17}$ units

C. $\sqrt{5}$ units

D. 5 units

Answer: D

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Part B Section Iii

1. Find the greatest positive integer that will divide 434 and 539 leaving remainders 9 and 12 respectively .

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2. For any positive real number x , prove that there exists an irrational number y such that

`0

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3. If the zeros of the polynomial $f(x) = x^3 - 3x^2 + x + 1$ are $a - b,\ \ a,\ \ a + b,$ find a and b.

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4. The nth terms of an A.P. $\frac{1}{m}, \frac{m+1}{m}, \frac{2m+1}{m}, \ldots$ is:

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

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6. $\frac{\tan^2 \theta}{(\sec \theta - 1)^2} = \frac{1 + \cos \theta}{1 - \cos \theta}$

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7. The diameter of a cycle wheel is 21 cm. How many revolutions will it make in moving a

distance of 66 m ?

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8. There are 100 cards in a bag on which numbers from 1 to 100 are written. A card is taken out form the bag at random. Find the probability that the number on the selected card

is divisible by 25

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9. There are hundred cards in a bag on which numbers from 1 to 100 are written. A card is taken out from the bag at random. Find the probability that the number on the selected card.

is a prime number greater than 80.

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Part B Section Iv

1. Without actually performing the long divison, find if $\frac{987}{10500}$ will have terminating or non-terminating (repeating) decimal expansion. Give reasons for your answer

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2. Show that the sum of an AP whose first term is a, the second term b and the last term c, is equal to $\frac{(a+c)(b+c-2a)}{2(b-a)}$.

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3. Determine the vertices of the triangle formed by the lines $4x - y = 4$, $4x + y = 12$ and the x - axis.

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4. A person on tour has Rs. 4200 for his expenses. If he expenses. If he extends his tour for 3 days, he has to cut down his daily expenses by Rs. 70. Find the original duration of the tour.

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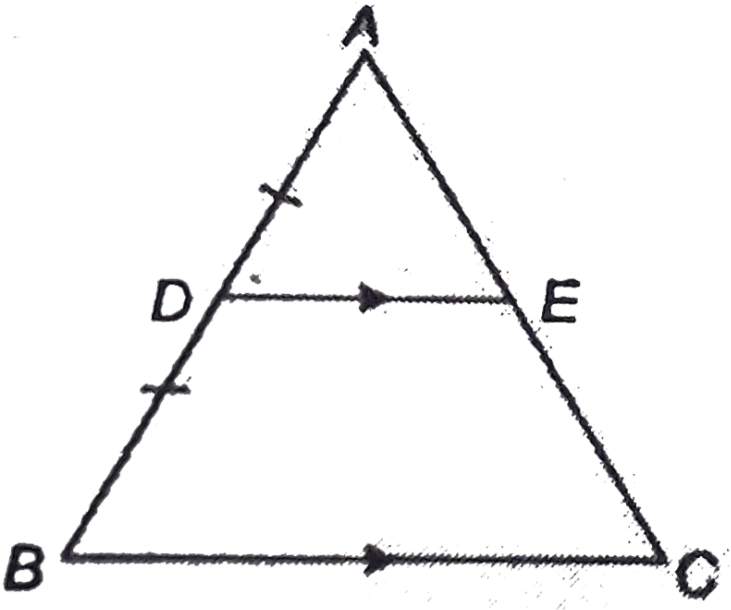
5. Prove using similar triangles, that a line drawn through the mid-point of one side of a triangle parallel to another side, bisects the

third side.



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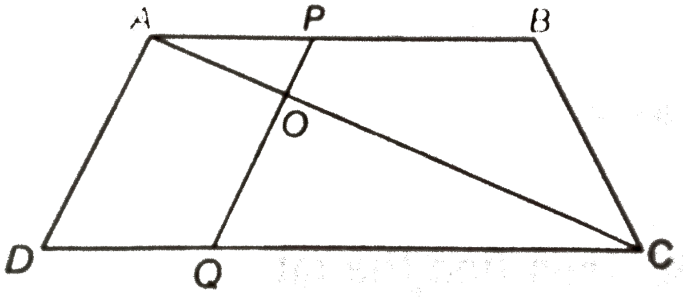
6. In figure , if $AB||DC$ and AC, PQ intersect each other at the point O. Prove that

OA.CQ=OC.AP.



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7. A circle touches all the four sides of a quadrilateral $ABCD$. Prove that: $AB + CD = BC + DA$.

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8. Sixteen glass spheres each of radius 2 cm are paced into a cuboidal box of internal dimension $20cm \times 10cm \times 10cm$ and then the box is filled with water. Find the volume of water filled in the box

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9. If the mean of the following data is 14.7 ,f in the values of p and q

Class	0-6	6-12	12-18	18-24	24-30	30-36	36-42	Total
Frequency	10	p	4	7	q	4	1	40

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Part B Section V

1. State and prove Basic Proportionality Theoram (Thales Theoram)

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2. If S is a point on side PQ of a ΔPQR such that PS=QS=RS, then

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3. A vertiacal pole is 60 m high, The angle of depression of two points P and Q on the ground are 30° and 45° respectively. If the points P and Q lie on either side of the pole, then find the distance PQ.

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4. Two towers stand on a horizontal plane. P and Q where PQ = 30 m, are two points on the

line joining their feet. As seen from P the angle of elevation of the tops of the towers are 30 and 60 but as seen from Q are 60 and 45. The distance between the towers is equal to

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5. Let AB be a vertical pole placed at point A on the ground. P and Q are two points on the ground such that points A, P and Q are collinear. Angles of elevation of ponit B (top of pole) from P and Q are 30° and 45°

respectively. If distance P and Q is 2m, then height ofthe pole is

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6. If the sum of first 7 terms of an A.P. is 49 and that of its 17 terms is 289, find the sum of first n terms of the A.P.

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