

8201109

FIRST TERMINAL EXAMINATION (CLASS-X)

7/2017

SUBJECT : MATHEMATICS (SET-A)

Time : 3 Hrs.

M.M.: 80

General Instructions :

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into four sections A, B, C and D. Section-A comprises of 6 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each; Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 8 questions of 4 marks each.
3. There is no overall choice.
4. Use of calculator is not permitted.

SECTION-A

Q1. The graph of $y = p(x)$ is given for a polynomial $p(x)$.
Find the number of zeroes of $p(x)$.

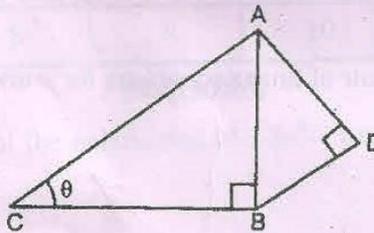
Q2. Check whether the following pair of linear equations is consistent or not :

$$2x + 3y = 6$$

$$4x + 6y = 12$$

Q3. For a given data, the 'less than ogive' and the 'more than ogive' intersect at (15, 40). Find the median of the data.

Q4. In the given figure, $AD = 4\text{cm}$, $BD = 3\text{cm}$ and $CB = 12\text{cm}$. Find the value of $\cot\theta$.



Q5. Three cubes each of side 1cm are joined end to end. Find the volume of the resulting cuboid.

Q6. ~~$\triangle ABC$ and $\triangle PQR$ are similar triangles such that $\angle A = 32^\circ$ and $\angle R = 65^\circ$. Find the measure of $\angle B$.~~

SECTION-B

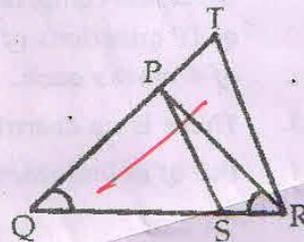
- Q7. Find a quadratic polynomial, sum of whose zeroes is 8 and their product is 12. Hence, find the zeroes of the polynomial.
- Q8. Find the mode for the following data :

Class Interval	0-20	20-40	40-60	60-80
Frequency	35	315	120	50

- Q9. In the adjoining figure, $\frac{QR}{QS} = \frac{QT}{PR}$ and

$\angle PQR = \angle PRQ$. Prove that $\Delta PQS \sim \Delta TQR$.

- Q10. The areas of two similar triangles ABC and PQR are in the ratio 9:16. If BC = 4.5cm, find the length of QR.



- Q11. If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$, $0^\circ < A + B \leq 90^\circ$, $A > B$, find the values of A and B.

- Q12. The radius of a sphere is 9cm. It is melted and drawn into a wire of diameter 2cm. Find the length of the wire.

SECTION-C

- Q13. From a solid cylinder of height 30cm and radius 7cm, a conical cavity of height 24cm and of base radius 7cm is drilled out. Find the volume of the remaining solid.

- Q14. Solve the following pair of linear equations for x and y :

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1, x \neq 1, y \neq 2$$

- Q15. A part of monthly hostel charges is fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 20 days, he has to pay ₹ 1,000 as hostel charges whereas a student B, who

takes food for 26 days pays ₹ 1,180 as hostel charges. Find the fixed charge and the cost of food per day.

Q16. Find the zeroes of the quadratic polynomial $4x^2 - 3 - 4x$. Verify the relationship between the zeroes and the coefficients of the polynomial.

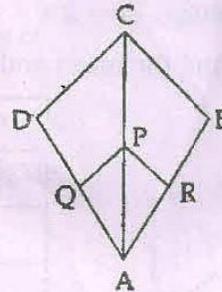
Q17. Find the value of $\operatorname{Cosec}30^\circ$ geometrically.

Q18. Without using trigonometric tables, evaluate :

$$\frac{2\sin68^\circ}{\cos22^\circ} - \frac{2\cot15^\circ}{5\tan75^\circ} - \frac{3\tan45^\circ \tan20^\circ \tan40^\circ \tan50^\circ \tan70^\circ}{5}$$

Q19. In the given figure, $PQ \parallel CD$ and $PR \parallel CB$.

Prove that $\frac{AQ}{QD} = \frac{AR}{RB}$



Q20. Solve by the method of cross multiplication :

$$5x - 6y = -9$$

$$3x + 4y = 25$$

Q21. The arithmetic mean of the following distribution is 53. Find the value of p.

Class Interval	0-20	20-40	40-60	60-80	80-100
Frequency	12	15	32	p	13

Q22. Change the following frequency distribution to more than type distribution and draw its ogive. Using the graph, find its median.

Classes	0-5	5-10	10-15	15-20	20-25
Frequency	6	8	10	6	4

SECTION-D

Q23. Find all the zeroes of the polynomial $x^4 - 3x^3 + 6x - 4$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

Q24. Solve graphically the pair of linear equations :

$$x - y + 1 = 0$$

$$3x + 2y - 12 = 0$$

Shade the region bounded by these lines and the x-axis.

Q25. A bucket made up of metal sheet is in the form of a frustum of a cone. Its depth is 24cm and the diameters of the top and the bottom are 30cm and 10cm respectively. Find the cost of the metal sheet used, if it costs ₹ 10 per 100cm^2 (Use $\pi = 3.14$).

Q26. A toy is in the form of a cone mounted on a hemisphere of common base radius 7cm. The total height of the toy is 31cm. Find the total surface area of the toy.

Q27. Prove that 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.

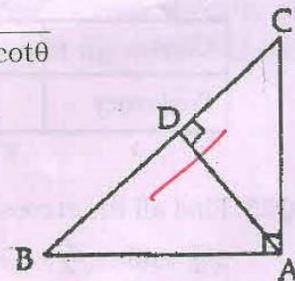
Q28. Find the mean and median of the following data :

Class Interval	Frequency
0-50	2
50-100	3
100-150	5
150-200	6
200-250	5
250-300	3
300-350	1

Q29. Prove that : $(\operatorname{cosec}\theta - \sin\theta)(\sec\theta - \cos\theta) = \frac{1}{\tan\theta + \cot\theta}$

Q30. (a) In the given figure, $\angle BAC = 90^\circ$ and $AD \perp BC$.
Prove that $AB^2 + CD^2 = BD^2 + AC^2$.

(b) Sahil saw a triangular banner on 'Yoga Day'. Give one importance of yoga and exercises in our daily life.



FOLLOWING QUESTIONS ARE TO BE CHANGED WITH Q6, Q9, Q10, Q30. (SET A)

Correction in Q6, Q9, Q10, Q30. (SET A)

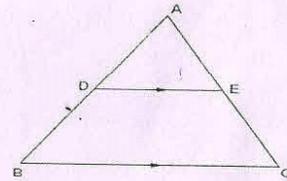
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Q6. In the given figure, $AD=2.1$ cm, $BD=4.2$ cm, $AE=2.3$ cm and $CE=4.6$ cm. Prove that $DE \parallel BC$.

Q9. Divide the polynomial $f(x) = 6x^3 + 13x^2 + x - 2$ by $g(x) = 2x + 1$ and find quotient and remainder.

Q10. Prove that $\sin^2 A + \cos^2 A = 1$.

Q30. (a) The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that ABCD is a trapezium.



(b) Sahil saw a triangular banner on 'Yoga Day'. Give one importance of yoga and exercises in our daily life.