

Ashwani Gupta

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Class - X

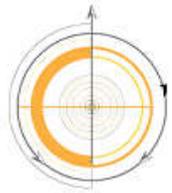
Sample Paper-2011-2012

Time: 3hrs.

M.M.: 80marks

SECTION - 'A' (carry one mark each)

- Can the decimal expansion of an irrational number be:
(a) Terminating (b) non-terminating recurring
(c) Both of them (d) none of these
- The zeroes of the polynomial $x^2 + 2x + 3$ are:
(a) $-2, -1$ (b) $2, -1$
(c) $3, -1$ (d) none of these
- The perimeter of two similar Δ 's ABC and PQR are respectively 36cm and 24cm. If PQ=10cm, then AB is equal to:
(a) 12cm (b) 15cm
(c) 18cm (d) 20cm
- If $\sin^2\theta = \frac{1}{4}$, then θ is equal to:
(a) 60° (b) 90°
(c) 45° (d) 30°
- If $\sin\theta + \cos\theta = \sqrt{2} \sin(90 - \theta)$, then $\cot\theta$ is:
(a) $\sqrt{2} - 1$ (b) $\sqrt{2} + 1$
(c) $-\sqrt{2} - 1$ (d) none of these
- If $4\sin A = 3\cos A$, then the value of $5\sin A + 5\cos A$ is:
(a) 7 (b) 1
(c) 12 (d) $\frac{4}{3}$
- Given that $\text{HCF}(336, 54) = 6$, then $\text{LCM}(336, 54)$ is:
(a) 3014 (b) 3034
(c) 3024 (d) 3104
- For what value of 'a', the system of linear equations $ax + 3y = a - 3$; $12x + ay = a$ has no solution:
(a) 6 (b) 3
(c) -7 (d) -6
- The value of $\frac{\cot 5^\circ \cot 10^\circ \cot 15^\circ \cot 60^\circ \cot 75^\circ \cot 80^\circ \cot 85^\circ}{(\cos^2 20^\circ + \cos^2 70^\circ) + 2}$ is equal to:
(a) $\frac{\sqrt{3}}{9}$ (b) $\frac{\sqrt{3}}{3}$
(c) $-\frac{\sqrt{3}}{9}$ (d) none of these
- Relation between mean, median and mode is:
(a) $2\text{Median} = 3\text{Mode} - \text{Mean}$ (b) $\text{Median} = 3\text{Mode} - 2\text{Mean}$
(c) $\text{Mode} = 3\text{Median} - 2\text{Mean}$ (d) All of these



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SECTION - 'B' (carry two marks each)

11. Roma has to make gift hampers out of 40 watches, 24 i-pods and 16 cell phones. The gift hampers are identical and contain at least one of each things. Find the maximum number of such gift hampers she can make without leaving anything?

12. Find a quadratic polynomial whose zeroes are $3 \pm \sqrt{5}$.

13. Find x and y.

$$\frac{x+y}{xy} = 2 \quad \frac{x-y}{xy} = 6$$

14. Find the value of:

$$\cot \theta + \operatorname{cosec} \theta; \text{ if } \cos \theta = \frac{3}{5}$$

Or

$$\sin^2 20^\circ + \sin^2 70^\circ - \tan^2 45^\circ$$

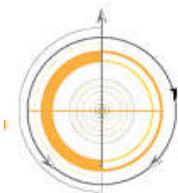
15. If the areas of two similar triangles are equal, prove that they are congruent.
16. E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\triangle ABE \sim \triangle CFB$
17. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabets in the surnames was obtained as follows:

Number of letters	1 – 4	4 – 7	7 – 10	10 – 13	13 – 16	16 – 19
Number of surnames	6	30	40	6	4	4

Find the median number of letters in the surnames?

18. 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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SECTION - 'C' (carry three marks each)

19. Find the greatest integer on dividing 394, 436, 542 leaves remainder 3, 11 and 15 respectively.
20. Prove that $\sqrt{2}$ is an irrational number.

Or

Prove that $2 + \sqrt{3}$ is an irrational number.

21. The area of a rectangle gets reduced by 80 sq. units if its length is reduced by 5 units & the breath is increased by 2 units. If we increase the length by 10 units & decrease the breath by 5 units, the area is increased by 50 sq. units. Find the length & breadth of the rectangle

Or

Two places A & B are 120 km apart from each other on a highway. A car starts from A & another from B at the same time. If they move in the same direction, they meet in 6 hrs. & if they move in opposite directions, they meet in 1 hour & 12 minutes. Find the speed of the cars.

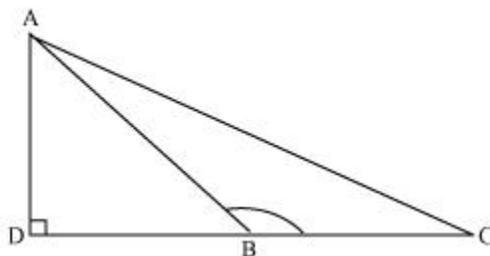
22. Find a quadratic polynomial whose one zero is $3 - \sqrt{5}$ & product of zeroes is 4 .
23. Prove that

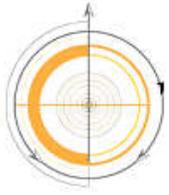
$$\tan^2 A + \cot^2 A + 2 = \sec^2 A \operatorname{cosec}^2 A$$

24. Prove that:

$$\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{2\sin^2 A - 1} = \frac{2}{1 - 2\cos^2 A}$$

25. Prove that the sum of the squares of the sides of rhombus is equal to the sum of the squares of its diagonals.
26. In the given figure, ABC is a triangle in which $\angle ABC > 90^\circ$ and $AD \perp CB$ produced. Prove that $AC^2 = AB^2 + BC^2 + 2BC \cdot BD$.





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27. If the median of the distribution is given below is 28.5, find the values of x and y .

Class interval	Frequency
0 – 10	5
10 – 20	x
20 – 30	20
30 – 40	15
40 – 50	y
50 – 60	5
Total	60

28.

The following table gives production yield per hectare of wheat of 100 farms of a village.

Production yield (in kg/ha)	50 – 55	55 – 60	60 – 65	65 – 70	70 – 75	75 – 80
Number of farms	2	8	12	24	38	16

Change the distribution to a more than type distribution and draw ogive.

SECTION - 'D' (carry four marks each)

29. Divide the polynomial $p(x)$ by the polynomial $g(x)$ and find the quotient and remainder

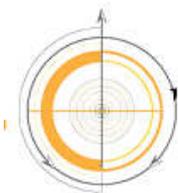
$$p(x) = x^4 - 3x^2 + 4x + 5, \quad g(x) = x^2 + 1 - x$$

30. Prove that:

$$\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{1 + \sin \theta}{\cos \theta}$$

Or

$$\left(\frac{1 + \sin \theta - \cos \theta}{1 + \sin \theta + \cos \theta} \right)^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$$



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31. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding medians.

OR

Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

32. If $A = 60^\circ$ and $B = 30^\circ$, verify that

(i) $\cos(A - B) = \cos A \cos B + \sin A \sin B$

(ii) $\sin(A + B) = \sin A \cos B + \cos A \sin B$

33.

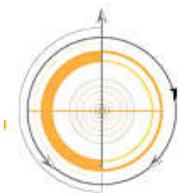
Solve the following equations of system graphically. Also, find the co-ordinates of the points where the line meets at y-axis:

$$2(x - 1) = y; \quad x + 3y = 15$$

34. During the medical check-up of 35 students of a class, their weights were recorded as follows:

Weight (in kg)	Number of students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive for the given data. Hence obtain the median weight from the graph verify the result by using the formula.



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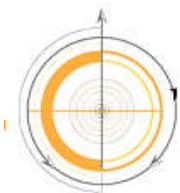
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Answers:

1. D
2. D
3. B
4. D
5. B
6. A
7. C
8. D
9. A
10. C
11. 8
12. $x^2 - 6x + 4$
13. $x = 4, y = 5$
14. 2 OR 0
15. To prove
16. To prove
17. 8.05
18. 69.43%
19. 17
20. To prove
21. Length = 40m breadth = 30m OR 60km/hr, 40km/hr
22. $x^2 - 6x + 4$
23. To prove
24. To prove
25. To prove
26. To prove
27. $x = 8, y = 7$



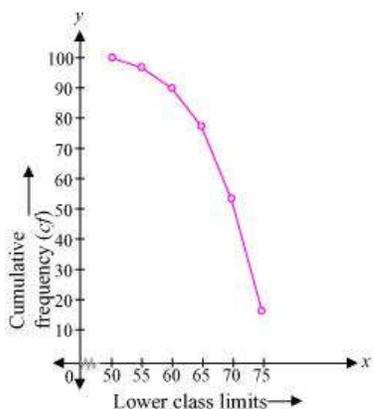
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28.



29. $Quotient = x^2 + x - 3$ and remainder = 8

30. To prove

31. To prove

32. To prove

33. To plot in graph

34.

