

**CBSE Board**  
**Class X Mathematics**  
**Sample Paper 3 (Basic)**

**Time: 3 hrs**

**Total Marks: 80**

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**General Instructions:**

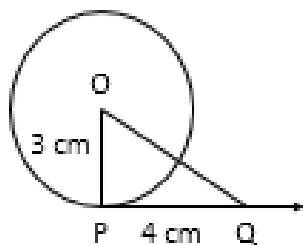
- a. All questions are compulsory
  - b. The question paper consists of 40 questions divided into four sections A, B, C and D.
  - c. Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section c comprises of 8 questions of 3 marks each. Section D comprises 6 questions of 4 marks each.
  - d. There is no overall choice. However internal choices have been provided in two questions of 1 mark each, two questions of 2 mark each, three questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
  - e. Use of calculators is not permitted.
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**Section A**

**(Questions 1 to 10 are multiple choice questions.**

**Select the most appropriate answer from the given options)**

1. The HCF  $(26, 169) = 13$  then LCM  $(26, 169) =$   
A. 26  
B. 52  
C. 338  
D. 13
2. If the arithmetic mean of 7, 8, x, 11, 14 is x then x =  
A. 9  
B. 9.5  
C. 10  
D. 10.5
3. Find OQ from the following figure:



- A. 1 cm
  - B. 4 cm
  - C. 5 cm
  - D. 12 cm
4. Which of the following is a pair of co-primes?
- A. (14, 35)
  - B. (18, 25)
  - C. (31, 93)
  - D. (32, 62)
5. If the probability of winning a game is 0.4, the probability of losing it is
- A. 0.96
  - B.  $\frac{1}{0.4}$
  - C. 0.6
  - D. None of these
6. Zeros of  $p(x) = x^2 - 2x - 3$  are
- A. 1, -3
  - B. 3, -1
  - C. -3, -1
  - D. 1, 3
7. HCF of  $(2^3 \times 3^2 \times 5)$ ,  $(2^2 \times 3^3 \times 5^2)$  and  $(2^4 \times 3 \times 5^3 \times 7)$  is
- A. 30
  - B. 48
  - C. 60
  - D. 105
8. If  $\alpha, \beta$  are the zeros of the polynomial  $f(x) = 2x^2 + 6x - 6$  then which of the following is true?
- A.  $\alpha + \beta = \alpha\beta$
  - B.  $\alpha + \beta > \alpha\beta$
  - C.  $\alpha + \beta < \alpha\beta$
  - D.  $\alpha + \beta + \alpha\beta = 0$
9. The distance of a point (4, 7) from the x-axis is
- A. 4
  - B. 7
  - C. 11
  - D.  $\sqrt{65}$

10. The mid-point of the line segment joining the points A(-2, 8) and B(-6, -4) is  
A. (4, 2)  
B. (-4, 2)  
C. (2, 6)  
D. (-4, -6)

**(Q 11 – Q 15) fill in the blanks**

11. The centroid of the triangle whose vertices are (-2, 3), (2, -1) and (4, 0) is \_\_\_\_
12. If the system of equations  $kx - 5y = 2$ ,  $6x + 2y = 7$  has no solution, then  $k =$  \_\_\_\_
13. The value of  $(1 - \cos^2 \theta) \operatorname{cosec}^2 \theta$  is \_\_\_\_
- OR**
- The value of  $\sin^2 29^\circ + \sin^2 61^\circ$  is \_\_\_\_
14. The value of  $(\sec^2 60^\circ - 1) =$  \_\_\_\_
15. Corresponding sides of two similar triangles are in the ratio 1:3. If the area of the smaller triangle is  $40 \text{ cm}^2$ , the area of the larger triangle is \_\_\_\_

**(Q 16 – Q 20) Answer the following**

16. Find the value of  $x$  if  $2\sin \frac{x}{2} = 1$ .
- OR**
- Find  $\theta$  if  $\sin(\theta + 36^\circ) = \cos \theta$  where  $\theta + 36^\circ$  is an acute angle.
17. The areas of two circles are in the ratio 4:9. Find the ratio of their radii?
18. The probability of guessing the correct answer to a certain test questions is  $\frac{x}{12}$ . If the probability of not guessing the correct answer to this question is  $\frac{2}{3}$  then find  $x$ .
19. Find the length of the hypotenuse of an isosceles right triangle whose one side is  $4\sqrt{2}$  cm.
20. If the first term of an A.P. is 2 and common difference is 4, then find the sum of its 40 terms.

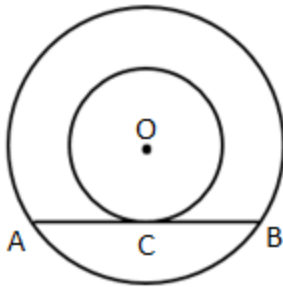
## Section B

21. There are 5 red, 2 yellow and 3 white roses in a flowerpot. Select one rose from it at random. What is the probability that the selected rose is
- Red
  - Yellow
22. A dice is thrown once. Find the probability of getting
- A prime number
  - A number lying between 2 and 5

**OR**

A bag contains 6 orange flavoured candies and 4 lemon flavoured candies. Ram takes out one Candy without looking into the bag. What is the probability that he takes out

- The orange flavoured candy
  - A lemon flavoured candy
23. In the given figure, O is the centre of two concentric circles. AB is a chord of the larger circle touching the smaller circle at C. Prove that  $AC = BC$ .



24. Prove that  $\sqrt{\frac{1 + \tan^2 A}{\cot^2 A + 1}} = \tan A$

**OR**

Evaluate  $\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$

25. The perimeter of a circular field is 242 m. Find the area of the field.
26. Read the following passage and answer the questions that follows:  
Teacher told a student to write some examples of a polynomial as a homework.  
I have written 8 examples on polynomial.
- $x^2 - 8x - 9$
  - $x^3 + 2$
  - $x^2 + 3x$
  - $x^2 + x + 1$

- v.  $x^3 + 1$
- vi.  $x - 9$
- vii.  $x^3 - 7x^2 - 4x + 6$
- viii.  $x^2 + x + 2$

1. How many of them are quadratic polynomial?
2. Divide the polynomial  $x^2 - 8x - 9$  by  $x - 9$ .

### Section C

27. Find  $k$  if the roots of  $3y^2 + ky + 12 = 0$  are real and equal.
28. Construct a  $\triangle ABC$  in which  $BC = 6.5$  cm,  $AB = 4.5$  cm and  $\angle ABC = 60^\circ$ . Construct a triangle similar to this triangle whose sides are  $\frac{3}{4}$  of the corresponding sides of  $\triangle ABC$ .
29. A solid metallic sphere of diameter 21 cm is melted and recast into a number of smaller cones, each of diameter 3.5 cm and height 3 cm. Find the number of cones so formed.

**OR**

A bucket made of a metal sheet is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm, respectively. Find the cost of the bucket if the cost of the metal sheet used is Rs. 15 per  $100 \text{ cm}^2$ . Use  $\pi = 3.14$ .

30. Prove that  $\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = 2 \operatorname{cosec} \theta$

**OR**

Prove that  $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = \sec \theta - \tan \theta$

31. Three sets of English, Mathematics and Science books containing 336, 240 and 96 books, respectively, have to be stacked in such a way that all the books are stored subject wise and the height of each stack is the same. How many stacks will be there?

**OR**

Prove that  $\frac{5\sqrt{2}}{3}$  is an irrational. Given that  $\sqrt{2}$  is an irrational.

32. Prove that the tangents drawn at the end points of a chord of a circle make equal angles with the chord.

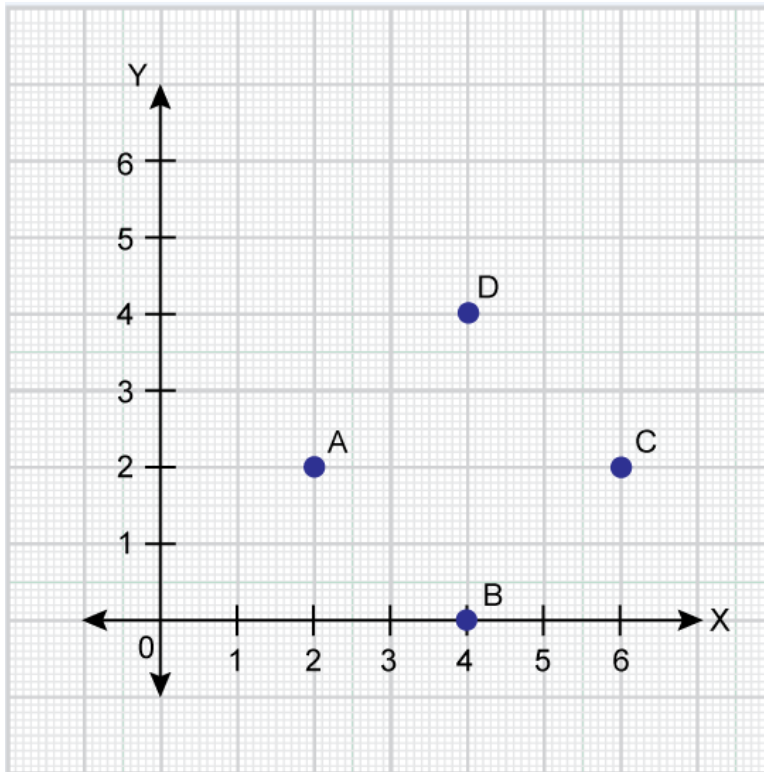
33. For what value of  $k$  will the system of equations have infinitely many solutions?

$$2x + 3y = 4 \text{ and } (k + 2)x + 6y = 3k + 2$$

34. Read the following passage and answer the questions that follows:

In a class room, four students A, B, C and D are sitting at  $A(2, 2)$ ,  $B(4, 0)$ ,  $C(6, 2)$  and  $D(4, 4)$  respectively. Then a new student E joins the class

- Teacher tells E to sit in the middle of the four students. Find the coordinates of the position where she can sit.
- Calculate the distance between A and C.
- Which two students are equidistant from B.



### Section D

35. From the following frequency distribution, prepare the 'more than ogive'.

Score	No. of candidates
400–450	20
450–500	35
500–550	40

550–600	32
600–650	24
650–700	27
700–750	18
750–800	34
Total	230

Also find the median.

**OR**

The table below shows the daily expenditure on food of 30 households in a locality:

Daily expenditure	No. of households
100–150	6
150–200	7
200–250	12
250–300	3
300–350	2

**36.** The sum of squares of two consecutive natural numbers is 421. Find the numbers.

**37.** Find the sum of all two-digit odd positive numbers.

**OR**

Divide 207 into three parts such that the numbers are in A.P. and the product of the two smaller parts is 4623.

**38.** From the top of a light house 200m high, the angles of depression of two ships on opposite sides of it are  $45^\circ$  and  $30^\circ$  respectively. Find the distance between two ships to the nearest metre.

**OR**

An aeroplane at an altitude of 200 meters observes the angles of depression of opposite points on the two banks of a river to be  $45^\circ$  and  $60^\circ$ . Find the width of a river.

- 39.** A toy is in the form of a cone mounted on a hemisphere. The diameter of the base and the height of the cone are 6 cm and 4 cm, respectively. Determine the surface area of the toy.
- 40.** If two triangles are equiangular, prove that the ratio of the corresponding sides is the same as the ratio of the corresponding altitudes.