CBSE Board

Class X Mathematics

Sample Paper 4 (Basic)

Time: 3 hrs **Total Marks: 80**

General Instructions:

a. **All** the 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 of **6** questions of 4 marks each.

d. There is no overall choice. However, an internal choices have been provided in **two questions of 1 mark** each, **two questions of 2 marks** 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 calculator is **not** permitted.

Section A

(Q 1 – Q 10 are multiple choice questions.
Select the most appropriate answer from the given options.)

1. HCF of 306 and 657 is

A. 3
B. 6
C. 9
D. 12

2. What will be the value of Mode if the Mean and Median of the data are 22.5 and 20 respectively?

A. 10
B. 15
C. 20
D. 25

3. The number of decimal places after which the decimal expansion of the rational number $\frac{23}{2^2 \times 5}$ will terminate, is

A. 1
B. 2
C. 3
D. 4

4. 425 can be expressed as a product of its primes as

A. $5^2 \times 17$

B. $5^2 \times 7$

C. $5^2 \times 13$

D. $2 \times 3^2 \times 5^2$

5. One card is drawn from a well shuffled deck of 52 cards. The probability that it is a king is

A. $\frac{1}{13}$

B. $\frac{1}{26}$

C. $\frac{1}{52}$

D. $\frac{2}{13}$

6. The product of the zeroes of the polynomial $2x^2 - 8x + 6$ is

A. 3

B. –3

C. 4

D. –4

7. Which of the following is the decimal expansion of a rational number?

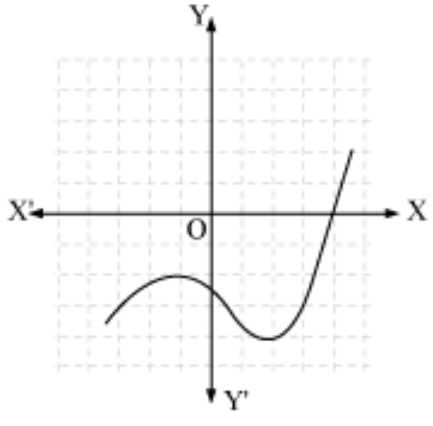
A. 4.020020002 .....

B. 0.15

C. 0.123...

D. 3.237898565 ....

8. The graph of y = p(x) is given in the following figure for some polynomial p(x). The number of zeroes of p(x) is



A. 1
B. 2
C. 3
D. 4

9. The distance of the point P(6, −8) form the origin is
A. 3 units
B. 5 units
C. 7 units
D. 10 units

10. The mid point of the line segment joining the points (−5, 7) and (−1, 3) is
A. (−3, 7)
B. (−3, 5)
C. (−1, 5)
D. (5, −3)

(Q 11- Q 15) Fill in the blanks:

11. The point which divides the line segment joining the points X(−1, 7) and Y(4, −3) internally in the ratio 2 : 3 is _____.

12. The pair of lines represented by the equation $2x + y + 3 = 0$ and $4x + ky + 6 = 0$ will be parallel if value of k is _____.

OR

The quadratic equation $2x^2 - 6x + 3 = 0$ has _____ roots.

13. The value of $2\tan^2 45° + \cos^2 30° - \sin^2 60°$ is _____.

14. Value of $\frac{\tan 26°}{\cot 64°}$ = _____.

15. The areas of two similar triangles are 9 cm^2 and 16 cm^2. The ratio of their corresponding sides is _____.

(Q 16- Q 20) Answer the following:

16. If $\sin(2A - 40°) = \cos 90°$, then find the value of A.

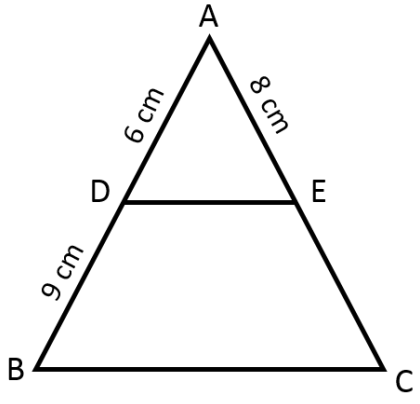
OR

Find the value of $\cos^2 54° - \sin^2 36°$.

17. Find the area of a sector of a circle with radius 6cm if angle of the sector is 60°.

18. If a digit is chosen at random from the digits 1, 2, 3, 4, 5, 6, 7, 8 and 9. Find the probability that it is an odd number.

19. In the adjoining figure, find AE.



20. Write the value of x for which 2x, x + 10 and 3x + 2 are in A.P.

Section B
(Questions 21 to 26 carry 2 marks each)

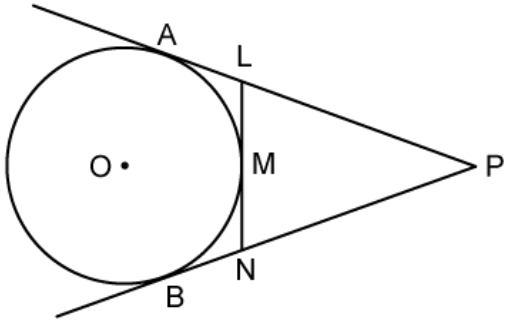
21. Two coins are tossed simultaneously. Find the probability of getting exactly one tail.

22. A bag contains 6 red, 8 black and 4 white balls. A ball is drawn at random. What is the probability that the ball drawn is black?

OR

In a simultaneous throw of a pair of dice, find the probability of getting a doublet.

23. In the given figure, PA and PB are tangents from an external point P to a circle with centre O. LN touches the circle at M. Prove that PL + LM = PN + MN



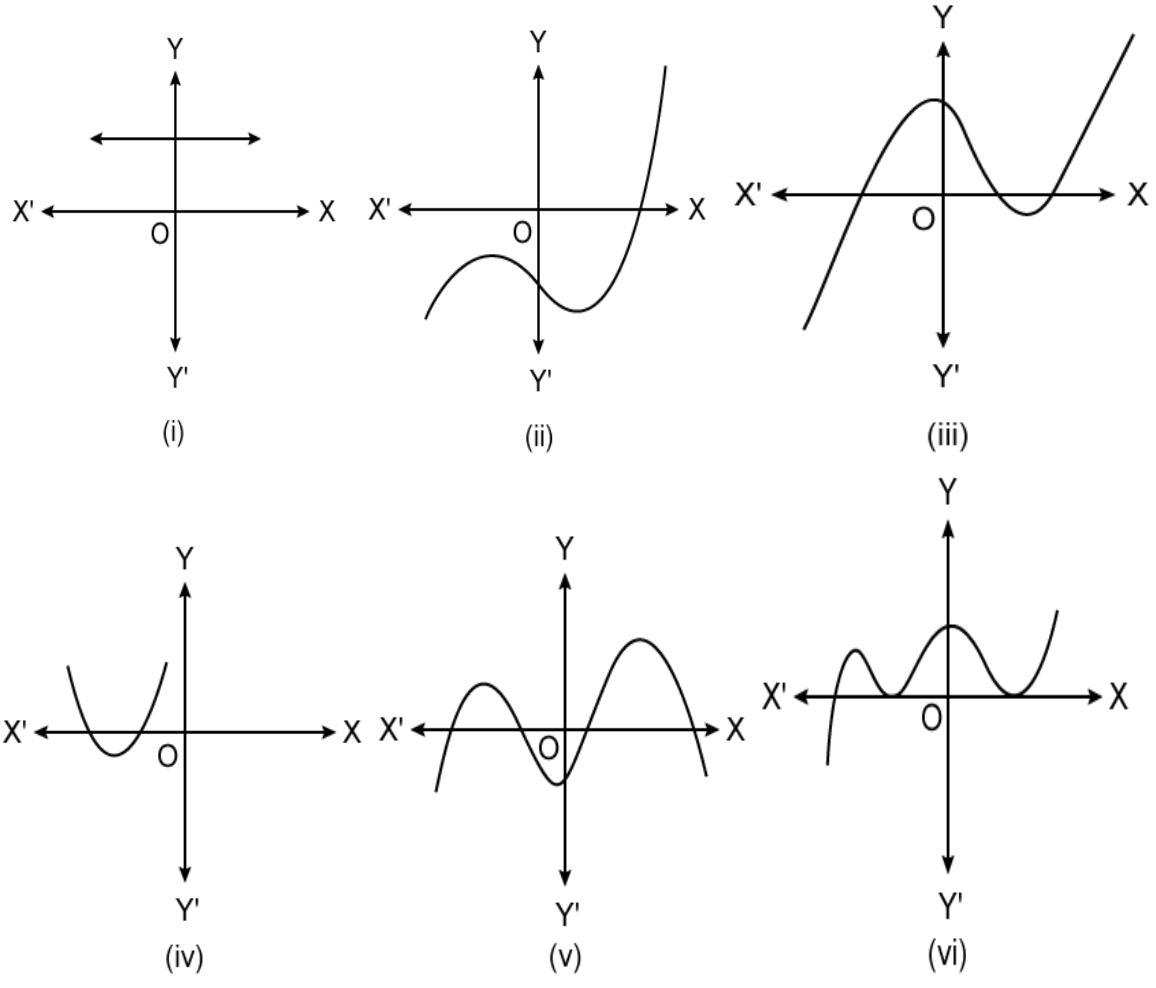
24. Find the value of sin 60° cos 30° + cos 60° sin 30°.

OR

If $\cot\theta = \frac{7}{8}$, evaluate $\frac{(1 + \sin\theta)(1 - \sin\theta)}{(1 + \cos\theta)(1 - \cos\theta)}$.

25. Find the area of a circle whose circumference is 22cm.

26. Read the following passage and answer the questions that follows:
A teacher told 6 students to draw the graph not having any zero, on the black board.



(i) Which student/s has drawn the correct graph? Write the reason for your answer.

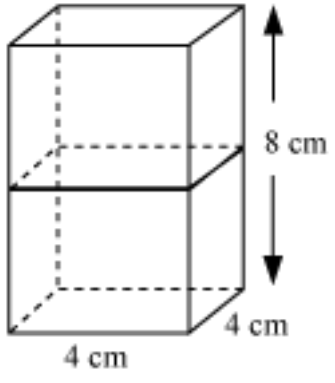
(ii) How many students draws the incorrect graphs?

Section C
(Questions 27 to 34 carry 3 marks each)

27. Find the zeroes of the quadratic polynomial $x^2 - 17x + 66$ and verify the relationship between the zeroes and coefficient.

28. Draw a line segment of length 7.6 cm and divide it in the ratio 5: 8. Measure the two parts.

29. Teacher told the students to find the surface area of the resulting cuboid when 2 cubes each of volume 64 cm^3 are joined end to end. What is the correct answer? Explain.



30. Prove that: $\sqrt{\frac{1}{1-\sin^2\theta}+\frac{1}{1+\tan^2\theta}+2\sec\theta\cos\theta}$ = secθ + cosθ

OR

Prove that: $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}=\frac{\cos\theta}{1+\sin\theta}$

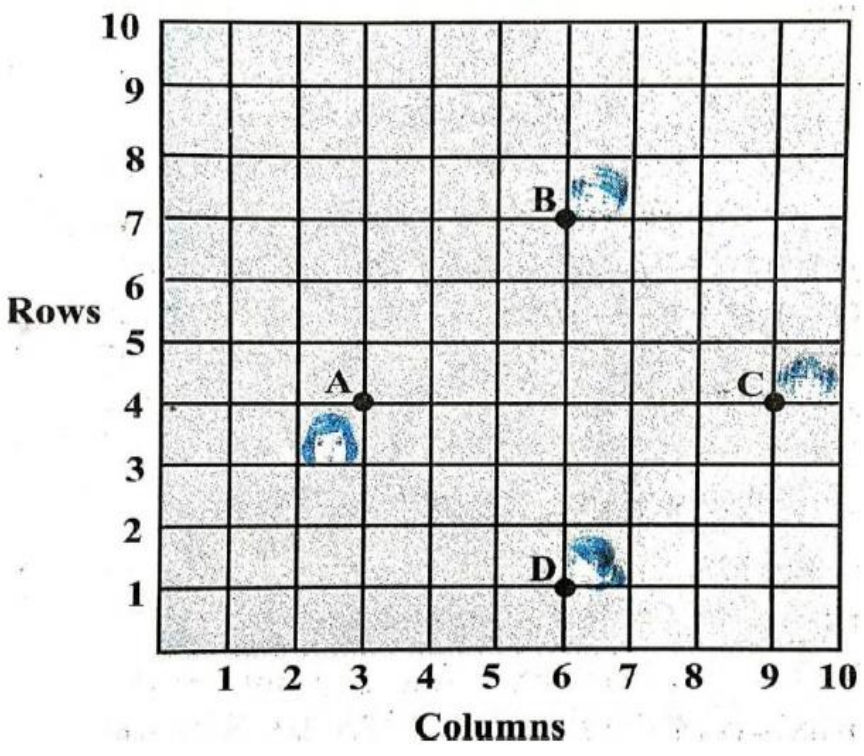
31. Three sets of English, Mathematics and Science books containing 336, 240 and 96 books, respectively, have to be stacked in such a way that all the books are stored subject wise and the height of each stack is the same. How many stacks will be there?

OR

Prove that $3+2\sqrt{5}$ is irrational, given that $\sqrt{5}$ is an irrational.

32. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

33. In a classroom, 4 friends are seated at the points A, B, C and D as shown in the below figure.



Rita and Seema walk into the class and after observing for a few minute Rita asks Seema "Don't you think all the 4 friends A, B, C and D are equidistant from each other?" Seema disagrees. Using distance formula, find which of them is correct.

34. The ratio of incomes of two people is 9:7 and the ratio of their expenditures is 4:3. If each of them saves Rs. 200 per month, then find their monthly incomes.

SECTION D

35. The hypotenuse of a right-angled triangle is 20 cm. The difference between its other two sides is 4 cm. Find the length of the sides.

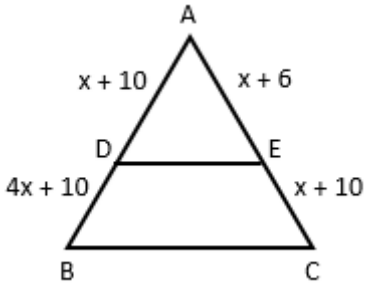
36. In an AP, if the 5^{th} and 12^{th} terms are 30 and 65, respectively, what is the sum of the first 20 terms?

OR

If the 9^{th} term of an AP is zero, then find the value of $2T_{19} - T_{29}$.

37. A kite is flying at a height of 90 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60°. Find the length of the string assuming that there is no slack in the string.

38. In the figure, for what value of x will seg DE be parallel?



OR

A vertical pole of a length 6 m casts a shadow 4m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

39. How many silver coins, 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid of dimension $5.5\text{ cm} \times 10\text{ cm} \times 3.5\text{ cm}$?

OR

Metallic spheres of radii 6 cm, 8 cm, and 10 cm, respectively, are melted to form single solid sphere. Find the radius of the resulting sphere.

40. 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.