

CBSE Board
Class X Mathematics
Sample Paper 5 (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 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.
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Section A

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

- 1. The sum of exponents of the prime factors in the prime factorisation of 196 is
 - A. 1
 - B. 2
 - C. 4
 - D. 6

- 2. Mode of the given data is _____
3, 5, 7, 4, 5, 3, 5, 6, 8, 9, 5, 3, 5, 3, 6, 9, 7, 4
 - A. 3
 - B. 4
 - C. 5
 - D. 9

3. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is
- A. 7cm
 - B. 12cm
 - C. 15cm
 - D. 24.5cm
4. If $\text{HCF}(26, 169) = 13$, then $\text{LCM}(26, 169) =$
- A. 26
 - B. 52
 - C. 338
 - D. 13
5. If $P(A) = 0.05$, then $P(\text{not } A) =$
- A. -0.05
 - B. 0.5
 - C. 0.9
 - D. 0.95
6. How many zeroes will a polynomial have if its curve does not touch the X – axis?
- A. 0
 - B. 1
 - C. 2
 - D. 3
7. $(5 + \sqrt{5}) - (1 + \sqrt{5})$ is a/an _____ number.
- A. Rational
 - B. Irrational
 - C. Prime
 - D. Odd
8. On dividing $x^2 - x + 1$ by $x - 1$, we get the remainder as
- A. -1
 - B. 0
 - C. 1
 - D. x

9. The area of the triangle whose vertices are (3, 4), (-1, 2) and (-2, 3) is
- A. 0
 - B. 1
 - C. 2
 - D. 3
10. What is the distance between (a, 0) and (0, b)?
- A. $\sqrt{a^2 + b^2}$
 - B. $\sqrt{a^2 - b^2}$
 - C. $\sqrt{a^2 b^2}$
 - D. $\sqrt{2a^2 b^2}$

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

11. If the distance between the points A (4, p) and B (1, 0) is 5, then the value(s) of p is/are ____.
12. The cost of a table is 3 times the cost of a chair. The total cost of 4 chairs and a table is Rs. 2100, then the cost of a table is equal to ____.

OR

The solution of a quadratic equation $x^2 + x - 2 = 0$ is equal to ____.

13. If $\cot A = \frac{4}{5}$, then $\frac{\sin A + \cos A}{\sin A - \cos A} = \square$.
14. If A and B are acute angles such that $\sin A = \cos B$, then $A + B =$ ____.
15. In an isosceles triangle ABC, $\angle C = 90^\circ$. If $AB = 8$ cm, then $AC =$ ____.

Answer the following:
(Q 16- Q 20)

16. If $\sin 2A = \cos 50^\circ$, then find the value of A.

OR

Find the value of $\frac{\sin 75^\circ + \cos 15^\circ}{\sin 75^\circ}$.

17. The diameter of a wheel is 35 cm. Find the circumference of the wheel.
18. Find the probability of getting non – face card from a deck of cards.
19. $\triangle ABC$ and $\triangle XYZ$ are similar, and if $AB = 11$ cm, $XY = 7$ cm and $BC = 22$ cm, then find the value of YZ .
20. Find the 28th term of the AP 5, 8, 11, 54,... .

Section B

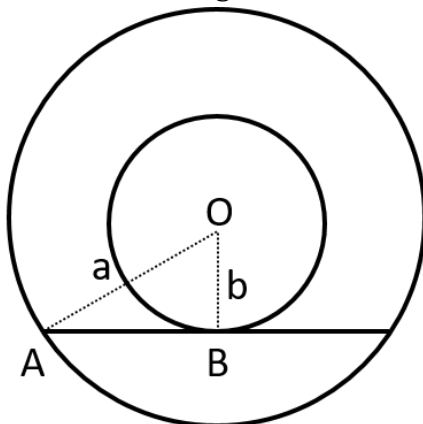
(Questions 21 to 26 carry 2 marks each)

21. A number card is drawn from a pack of 15 cards numbered from 1 to 15. Find the probability that the card bears a number which is divisible by 4.
22. What is the probability of getting a working bulb out of 5 defective bulbs mixed with 6 good bulbs?

OR

Five cards of diamond—ten, jack, queen, king and ace—are shuffled face downwards. One card is picked at random. If a king is drawn first and put aside, what is the probability that the second card picked is king?

23. Two concentric circles of radii a and b ($a > b$) are given. Find the length of the chord of the larger circle which touches the smaller circle.



24. Find the value of $(\sin A + \cos A)^2 + (\sin A - \cos A)^2$.

OR

Find the value of $\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$.

25. The area and perimeter of a rectangle are equal. Find the breadth of the rectangle if the length is twice the breadth of the rectangle.
26. Read the following passage and answer the questions that follows:
A teacher told students to fill the boxes with the correct answer.

Degree	Name of the polynomial	Form of the polynomial
<input type="text"/>	<input type="text"/>	$f(x) = a$, a is a constant
<input type="text"/>	<input type="text"/>	$f(x) = ax + b$, $a \neq 0$
<input type="text"/>	<input type="text"/>	$f(x) = ax^2 + bx + c$, $a \neq 0$
<input type="text"/>	<input type="text"/>	$f(x) = ax^3 + bx^2 + cx + d$, $a \neq 0$

Rahul got all the answers correct.
What is the correct Table?

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

27. Obtain the remaining zeros of the polynomial $2x^3 - 4x^2 + x + 2$ if two of its zeros are $\sqrt{2}$ and $-\sqrt{2}$.
28. Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct a pair of tangents to the circle and measure their lengths.

OR

Draw a line x and take any point R outside that line. Through the point R draw a line y perpendicular to line x .

29. Marbles of diameter 1.4 cm are dropped into a cylindrical beaker of diameter 7 cm containing some water. Find the number of marbles which should be dropped into the beaker so that the water level rises by 5.6 cm.

30. Prove that: $\frac{\sin A - \sin B}{\cos A + \cos B} + \frac{\cos A - \cos B}{\sin A + \sin B} = 0$.

OR

Evaluate:

i. $\tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$

ii. $\sin^2 45^\circ - \tan^2 60^\circ + \cos^2 90^\circ$

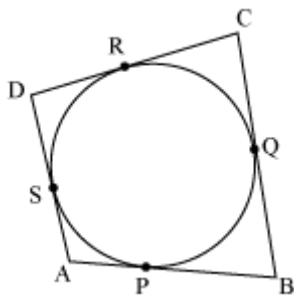
31. Find HCF of 963 and 657 by using Euclid's Division Algorithm.

OR

Write the decimal expansion of the rational number

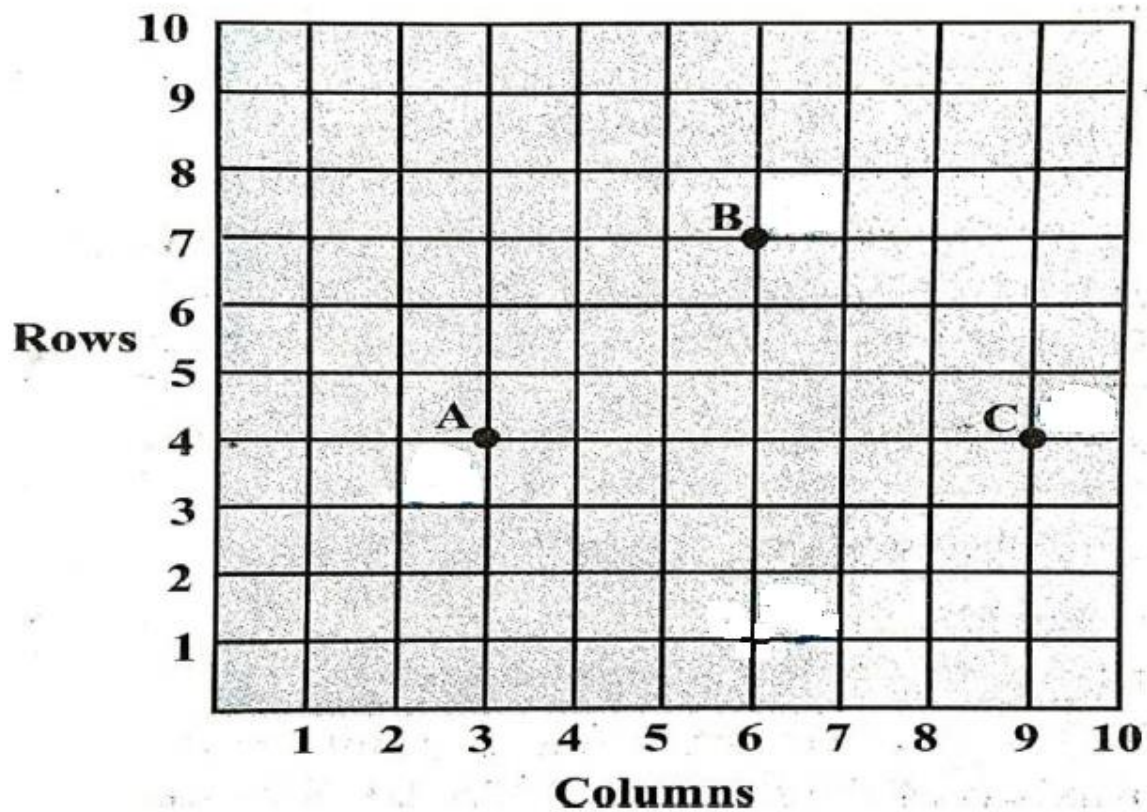
$$\frac{129}{2^2 \times 5^7}$$

32. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$.



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

In a class room, three students Ritu, Ankita and Rahul are sitting at positions A, B and C respectively.



Teacher asks the students:

- i. These three students form which type of triangle?
- ii. What is the area of the triangle?
A(3, 4), B(6, 7) and C(9, 4)

34. Solve the following pair of linear equations by Substitution Method.

$$0.2x + 0.3y = 1.3$$

$$0.4x + 0.5y = 2.3$$

Section D
(Questions 35 to 40 carry 3 marks each)

35. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.
36. If S_n denotes the sum of the first n terms of an AP, then prove that $S_{12} = 3(S_8 - S_4)$.

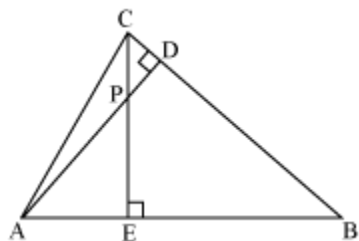
OR

Which term of the given AP is -150 ?

11, 8, 5, 2, ...

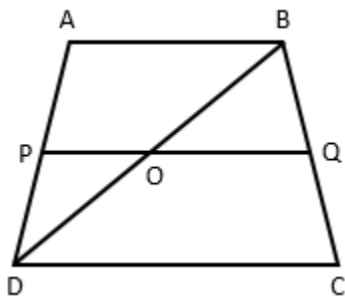
37. Two poles of equal heights are standing opposite to each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30° , respectively. Find the height of poles and the distance of the point from the poles.

38. In the figure, altitudes AD and CE of $\triangle ABC$ intersect each other at the point P. Show that:



- (i) $\triangle ABD \sim \triangle CBE$
- (ii) $\triangle PDC \sim \triangle BEC$

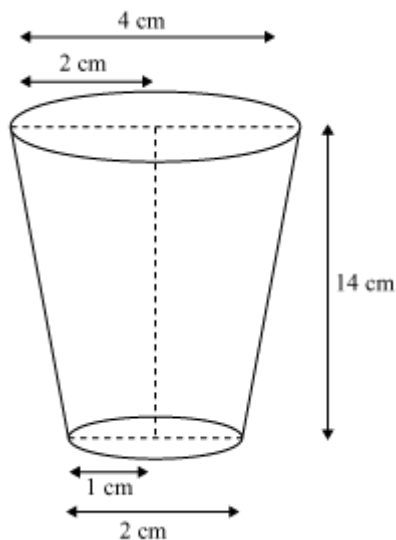
OR



ABCD is a trapezium in which $AB \parallel DC$ and $PQ \parallel DC$.

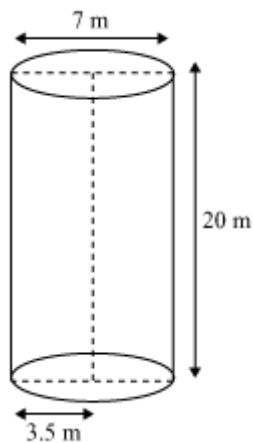
If $PD = 18$ cm, $BQ = 35$ cm and $QC = 15$ cm, then find PA .

39. A drinking glass is in the shape of a frustum of a cone of height 14 cm. The diameters of its two circular ends are 4 cm and 2 cm. Find the capacity of the glass.



OR

A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform.



40. The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. Find the median, mean and mode of the data and compare them.

Monthly consumption (in units)	Number of consumers
65 – 85	4
85 – 105	5
105 – 125	13
125 – 145	20
145 – 165	14
165 – 185	8
185 – 205	4