CBSE SAMPLE PAPER
Class X Mathematics
Paper 1(Questions)

Time: 3 hrs   **Total Marks: 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. Use of calculator is not permitted.

Section A

### (Questions 1 to 6 carry 1 mark each)

1. Ram tossed a coin for 560 times in which he got head 230 times. What is the probability of him getting a tail, while tossing the coin?

(OR)

There were 8 socks of white, green and blue shuffled in a draw. The probability of selecting a white sock is $\frac{1}{4}$. What is the probability of selecting a green sock if the probability of selecting the yellow sock is $\frac{5}{8}$?

2. A post is standing on the ground whose shadow's length is 20 m less when sun's altitude is 80° and the post's altitude is 45°. Draw a diagram to represent this situation.

3. Observe the given diagram and find the scale factor for the polygons.
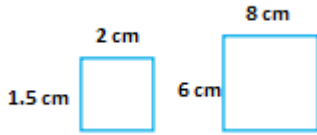
4. Find whether $x = 5$ is the root of the equation $x^2 - 13x + 40 = 0$

5. Consider the pair of integers (23, 8). Using Euclid's division lemma, find the highest possible value of r and corresponding q (q not equal to zero).

(OR)

Give a method to produce an irrational number.

6. Observe the given figure and find the value of FE if BD = 3cm, BF = 6cm, BE = 8cm and EC = 9cm. Also note that AC and DE are parallel pairs and DF and AE are parallel pairs.
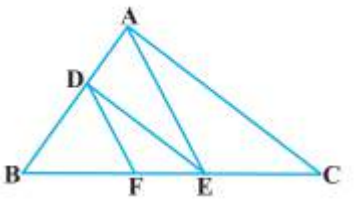
Section B

**(Questions 7 to 12 carry 2 marks each)**

7. Factorize the given quadratic equation and find their roots. $3x^2 - 10x - 4 = -12$

(OR)

Find one of the zero of the given polynomial by plotting a graph: $x^2 - 15x + 44 = 0$

**8.** Find the HCF of 792 and 402 by Euclid's Lemma algorithm.

9. Lines TP and TQ are tangents drawn from an external point to the circle. If the line that intersects at the middle point of PQ from T is 4 cm, and the length of the chord is 2 cm. Find the area of the circle.
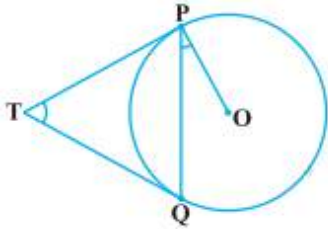
10. If the ratio of circumference to area of a circle is 2:5. Then what is the diameter of the circle?

11. Ranjana is standing at the garage of her house and looks at the top of her opposite house. She wanted to calculate the height of her opposite side house. What are the data required to calculate it?

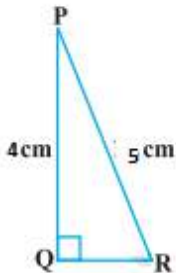**12.** Observe the given diagram and find the value of AC.
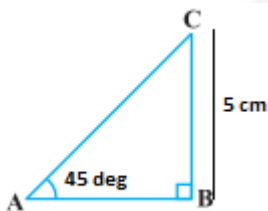
(OR)

Evaluate the value of $\dfrac{2 \sin 30° \times \tan 45° + \cos 60° \times \cot 30°}{(\sin^2 30° \cos^2 30°)}$

Section C

(Questions 13 to 22 carry 3 marks each)

13. Find the value of $\frac{\cos^2 P - \sin^2 Q}{\cos^2 R}$ from the given diagram.

(OR)

If $\tan \theta = \frac{5}{6}$, find the value of $\frac{2+3\sin\theta}{2+3\cos\theta}$

14. Find the point on the y-axis, which is equidistant from (4, 1) and (-3, 5)

15. Find the roots of the equation, $x^2 + 22x - 75 = 0$ by completing a square method.

16. Rani went to a mart and bought some items for her showcase. On returning, she met her old friend to whom she told "the number of flower vases I bought is two more than three times the number of dolls I purchased. And also the number of dolls, I purchased is two less than half of the total number of vases". If the cost of single flower vase is Rs.10 and her total cost is Rs.94, find the cost of single doll and find how many vases and dolls did she purchase? Explain it by substituting method.

17. Gita's purse had some coins and also she has 78 - 2 rupee coins, 102- 5 rupee coins and 111-10 rupee coins. How many compartments did she need at the minimum to hold all the coins in such a way that every compartment has same number of coins in the same category?

(OR)

Diya was flying in an aeroplane. Due to some technical defect, all were asked to jump of the flight with the parachute. When she looked down, she saw a rectangular land with a lake in the middle of it like shown below. Her parachute didn't work, what is the probability that she will fall into the pool?
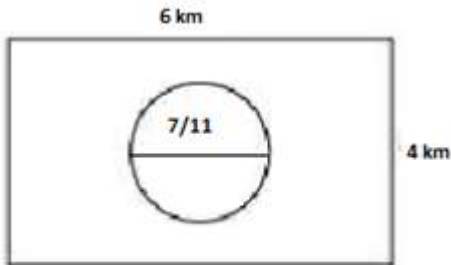
18. Sita and Simran wanted to go for a vacation with their families and booked two cars individually in zoomcar.com. The rent for the car for 12 hours is fixed and above that, additional amount will be collected for every hour. Sita paid Rs.4600 for 17 hours, while Simran paid, Rs. 3800 for 13 hours. Calculate the fixed charge and extra charge per hour.

19. Find the coordinated points which quadrasects the line segments joining the points A(-3, 6) and B(4, -2)

20. The following table shows the scores of the students in Mathematics exam. Find the value of the A if the mean of the data is 60 by direct method.

Class	0-20	20-40	40-60	60-80	80-100	100-120
Number of students	20	35	52	A	38	31

(OR)

Sita throws a dice for 60 times. Instead of the numbers, the dice she threw had letters "H-A-P-P-I-E" on the corresponding sides of the dice. What is the probability that she,

i) Will get an vowel while throwing a dice
ii) Won't get the letter "p"
iii) Any letter in the alphabet that is above the letter "H"

21. Let AB and AC are the two sides of a triangle where a line intersects the triangle at D and E. If this line is parallel to BC, find the value of 2AB. Given AD =6 cm and AC = 2AE.

22. In a pack of well shuffled deck of 52 cards, what is the probability

i)   To get a red card number above 6?
ii)   To get a black even number card
iii)   To get a numbered card which is multiple of 3

(OR)

Find the probability that in the year 2100 to have with 53 weekdays apart from Saturday, Friday and Monday.

Section D

(Questions 23 to 30 carry 4 marks each)

23. Construct a triangle ABC in such a way that angle C = 60° and angle B = 70° and BC = 10cm. construct one more triangle such that, this triangle has length 4 times more than ABC triangle on one side and 2 times more one another side.

24. Check whether -112 is one of the terms of the given Arithmetic progression 980, 941, 902, ……….. If so find which term is it and find the tenth term from it?

25. Let us consider a trapezium ABCD where AB is parallel to CD and two diagonals are drawn which meet at the point O. if AO = 3cm, OC = 2cm, and OD = 6cm. Find the ratio between AB and DC.

26. Rangeela told her grandmother that, "Three years later, I would be 3.5 times your age at that time. Also 8 years ago, my age was 5 more than 6 times of your age at that time". Calculate the current age of Rangeela and her grandmother and represent it graphically.

(OR)

Find the ratio in which the point (k, 4) segments the line segment that is joining the points A(5, -2) and B(-1, 7) and also find the value of k.

27. Mani whose height is 2m is standing in front of a lamp post of height 50m. At a point S, he found that the angle of elevation from his eyes to the top of the lamp post is 45° and the when he walked towards the lamp post at point T, the angle of elevation become 60°. Find the distance he walked from A to B.

(OR)

Reema house had a chimney where in front of there was a tall oak tree. The angle of elevation from the top of the chimney to top of the tree is 30°. Similarly, the angle of depression from the top of the chimney to bottom of the tree is 45°. The distance between the foot of the tree and the base of her building is 50meters. Find the height of the building and the height of the tree.

28. An iron drainage tube is in the shape of right circular cylinder in its lower part, while the upper part looks like right circular cone. The radius of the base of the cone as well as the base of the cylinder is 6 m. The cylindrical portion is 20 m tall and the conical portion is 9 m tall. Find the mass of a single tube if the $1\ m^3$ weighs 7 kgs.

29. A toy is in the shape of hemisphere surmounted by a right circular cone. The height of the cone is 10 cm and the diameter of the base is 6 cm. Find the volume of the toy. If a cube circumstances the toy, then identify the difference between the volume of the cube and the toy. Also find the total surface area of the toy.

30. The following table gives the distribution of fruits produced by 140 trees per season.

Production yield per tree	50-60	60-70	70-80	80-90	90-100	100-110
Number of trees	18	20	24	28	34	16

Change the distribution to more than type and draw ogive.

(OR)

Find the value of "l" if the mean of the given distribution is 56. Given table is the data for some students and their marks in Science subjects.

Marks obtained	20	30	40	50	60	70	80	90
Number of students	3	7	8	9	7	P	4	9