

CBSE SAMPLE QUESTION PAPER CLASS-X (2017)

MATHEMATICS

Time Alloted: 3 Hrs.

Max. Marks: 80

General Instructions :

- (i) All questions are **compulsory**.
- (ii) The question paper consists of **31** questions divided into four **sections A, B, C and D**. **Section-A** comprises of **4** 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 **11** questions of **4 marks** each.
- (iii) There is no overall choice.
- (iv) Use of calculator is not permitted.

SECTION-A

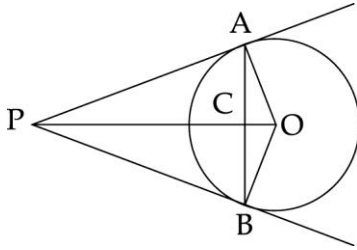
Question numbers **1** to **4** carry **one** mark each.

- 1 What is the 27th positive odd number? 1
- 2 If the ratio of the height of a tower and the length of its shadow is $\sqrt{3}:1$. What is the elevation of the source of light ? 1
- 3 A number x is chosen at random from the number $-4, -3, -2, -1, 0, 1, 2, 3, 4$. What is the probability that $|x| < 2$? 1
- 4 How can you show using distance formula three points A, B, C (in order) whose coordinates are given are collinear? 1

SECTION-B

Question numbers **5** to **10** carry **two** marks each.

- 5 Solve the equation $2^{2x+3} = 65(2^x - 2) + 122$. 2
- 6 In a certain AP, the 32nd term is twice the 12th term. Prove that 70th term is twice the 31st term. 2
- 7 From an external point P, two tangents PA and PB are drawn to a circle with centre O as shown in the figure. Prove that OP is the perpendicular bisector of chord AB. 2

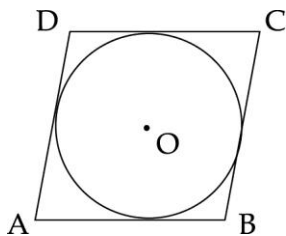


- 8 Draw a line segment of length 5 cm. divide it in the ratio 3 : 7. 2
- 9 Draw a circle of radius 2.8 cm. Take a point P at a distance of 5 cm from the centre the 2
circle and construct a pair of tangents to the circle from point P.
- 10 If V is the volume of a cuboid of dimensions a, b and c and S is the surface area, then 2
prove that $\frac{1}{V} = \frac{2}{S} \left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right)$.

SECTION-C

Question numbers 11 to 20 carry 3 marks each.

- 11 If $(x^2 + y^2)(a^2 + b^2) = (ax + by)^2$, prove that, $\frac{x}{a} = \frac{y}{b}$. 3
- 12 How many terms of the AP : 9, 17, 25, must be taken to get a sum of 450 ? 3
- 13 3

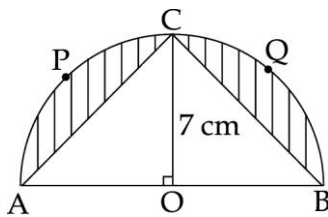


A parallelogram ABCD is drawn to circumscribe a circle as shown in the figure. Prove that ABCD is a rhombus.

- 14 The angles of elevation of the top of a tower from two points at distances 3
10 metres and 5 metres from the base of the tower and in the same straight line with it are
complementary. Find the height of the tower.
- 15 Sum of digits of a 2 digit number is 12 : 3
- (a) Find the probability that such a number is odd.
- (b) Find the probability that such a number is less than 30.
- (c) Find the probability that such a number is divisible by 4.
- 16 Find the coordinates of the centroid of a triangle, whose vertices are 3
A $(2\sqrt{5}, \sqrt{2})$, B $(5\sqrt{5}, \sqrt{8})$ and C $(\sqrt{125}, -2\sqrt{2})$.
- 17 If two adjacent vertices of a parallelogram are (8, 2) and (- 5, 10) and the diagonals intersect 3
at the point (3, 5), find the other vertices of the parallelogram.
- 18 ABCD is a trapezium with $AB \parallel DC$, $AB = 18\text{cm}$, $DC = 32\text{ cm}$ and distance between AB 3
and DC = 14 cm. If arcs of equal radii 7 cm with centres A, B, C and D have been

drawn, then find the area of the region of the trapezium which is not the part of the sectors drawn.

- 19 Water is flowing at the rate of 10 km/h through a pipe of diameter 14 cm into a rectangular tank which is 70 m long and 22m wide. Find the time in which the level of the water in the tank will rise by 50 cm. (Use $\pi = \frac{22}{7}$) 3
- 20 In the given figure, a semicircle APCQB is drawn on the diameter AOB and $OA = OB = OC = 7$ cm. Find the area of the shaded region. (Use $\pi = \frac{22}{7}$) 3



SECTION-D

Question numbers **21** to **31** carry **4** marks each.

- 21 The numerator of a fraction is 1 less than the denominator. If 3 is added to each of the numerator and demoninator, the fraction is increased by $\frac{3}{28}$. Find the fraction. 4
- 22 The four angles of a quadrilateral form an AP. If the sum of the first three angles is twice the fourth angle, then find all the angles. 4
- 23 Solve for x : 4
- $$\frac{5}{2x+3} = \frac{4}{x} - 3, \quad x \neq 0, \quad \frac{-3}{2}$$
- 24 Prove that the intercept of a tangent between two parallel tangents to a circle subtends a right angle at the centre of the circle. 4
- 25 Construct a ΔPQR in which $QR = 6$ cm, $\angle Q = 60^\circ$ and $\angle R = 45^\circ$. Construct another triangle similar to ΔPQR such that its sides are $\frac{5}{6}$ of the corresponding sides of ΔPQR . 4
- 26 As observed from the top of a 150 m tall temple, the angles of depression of two ships approaching it are 30° and 45° . If one ship is directly behind the other, find the distance between the two ships (Use $\sqrt{3} = 1.732$) 4
- 27 Ravi plays a game in which he has to draw one ball from a box containing 3 Red, 4 white and 3 green balls. On drawing a white ball Ravi is rewarded with ₹ 10. On 4

drawing a red ball Ravi is to pay a penalty of ₹ 5 and in other cases there neither any reward nor penalty. Find

- (i) P (Ravi is rewarded ₹ 10)
- (ii) P (Ravi does not lose)
- (iii) P (Ravi pays a penalty of ₹ 5)

- 28 Find the ratio in which the line segment joining the points A(6, 4) and B(1, -7) is divided by the x-axis. Also, find the distance AB and the co-ordinates of the point on the x-axis which cuts the line segment joining A and B in the required ratio. 4
- 29 After the celebration of independence day, the school has decided to distribute sweets (four laddus) having a volume 4 to each student. For the same purpose they have taken the total ingredients of 291060 cm^3 Lts. If the diameter of a laddu is 7cm find the total number of laddus and the number of students. What is the importance of independence in our life ? 4
- 30 A plot is in the form of a rectangle ABCD having a semicircle on BC. If AB = 60 m and BC = 28 m, find the area and perimeter of the plot. 4
- 31 In a factory, 5000 pencils are manufactured daily. The pencils are cylindrical in shape having length 25 cm and circumference of base as 1.5 cm. Find the cost of colouring the curved surfaces of the pencils manufactured in one day at the rate of 50 paise per cm^2 . (Use $\pi = \frac{22}{7}$) 4

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