

16 MARCH 2016

SET-B

SUMMATIVE ASSESSMENT - II
MATHEMATICS
Class - X

Time allowed : 3 hours

Maximum Marks : 90

SECTION-A

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

1 Find the distance of the point $(5, -12)$ from the origin.

2 The given spinner is spun once what is the probability of obtaining a multiple of 2 ?



1

3 Does the cubes of natural numbers form an A.P. ? Give reason.

1

4 The shadow of a pole at a particular time of the day is $\frac{1}{\sqrt{3}}$ times the height of the pole. What is the elevation of the source of light?

1

SECTION-B

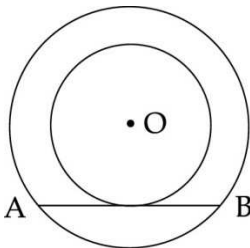
Question numbers 5 to 10 carry **two** marks each.

5 A triangle ABC circumscribes a circle touching the sides AB, BC, CA at points P, Q, R respectively. If $AP = 6\text{cm}$, $BP = 8\text{cm}$ and $AC = 14\text{cm}$, find the length of BC.


2

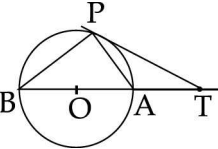
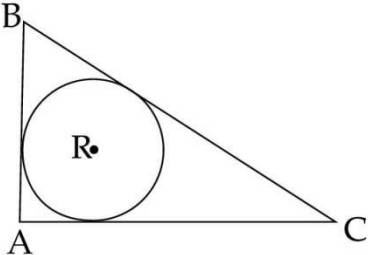
6 In the figure, out of the two concentric circles, the radius of the bigger circle is 5 cm and the length of the chord AB of the same circle is 8 cm, which is a tangent to the smaller circle. Find the radius of the smaller circle.

2



7	If the numbers $x - 2$, $4x - 1$ and $5x + 2$ are in AP, then find the value of x .	2
8	Some children, playing on the beach, dig out sand for making a hollow cylinder in the ground of radius 14 cm and depth 20 cm. They then use this sand to make a cone like structure of radius 14 cm. What is the height of the cone ?	2
9	Find the 7 th term from the end of the AP : 7, 10, 13, ..., 184.	2
10	Draw a line segment of length 7.7 cm and divide it internally in the ratio 3 : 4.	2
SECTION-C		
Question numbers 11 to 20 carry 3 marks each.		
11	A tower stands on a horizontal plane and is surmounted by a flagstaff of height 5 m. From a point on the plane, the angles of elevation of the bottom and the top of the flagstaff are 30° and 60° respectively. Find the height of the tower.	3
12	Find the coordinates of the centroid of a triangle whose vertices are $A(2\sqrt{3}, \sqrt{2})$, $B(\sqrt{27}, \sqrt{8})$ and $C(\sqrt{3}, -2\sqrt{2})$.	3
13	Write whether the following statements are true or false. Justify your answers. (i) Every quadratic equation has atleast one real root. (ii) If in a quadratic equation in x the coefficient of x is zero, then the quadratic equation has no real roots.	3
14	Using paper-mache, a student made a right circular hollow cone of height 15 cm and radius of base 8 cm. He then has to paint this cone from outside and inside both. Find is the total surface area that has to be painted.	3
15	Find the sum of the first 31 terms of the AP : 9, 4, -1, ...	3
16	ABCD is a trapezium with $AB \parallel DC$, $AB = 18$ cm, $DC = 32$ cm and distance between AB 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.	3
17	Draw an equilateral triangle of side 4 cm and then another triangle whose sides are $\frac{5}{4}$ of the corresponding sides of the first triangle.	3
18	A right circular cone has been placed upon cylinder. The base of the cone fully coincides with base of the cylinder and covers it. If the area of the base of the cylinder is 154 cm^2 , height of the cylinder is 10 cm and the volume of the entire solid is 1848 cm^3 , calculate the total height of the solid.	3
19	If $(5, 2)$, $(-3, 4)$ and (x, y) are collinear, show that $x + 4y - 13 = 0$.	3

20	A pair of dice thrown once. What is the probability of getting a doublet of odd number ?	3
SECTION-D		
Question numbers 21 to 31 carry 4 marks each.		
21	The sum of n terms of a sequence is $3n^2 + 4n$. Find the n^{th} term and show that the sequence is A.P.	4
22	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
23	The sum of areas of two squares is 640 m^2 . If the difference of their perimeters is 64 m, find the sides of the two squares.	4
24	All the queens are removed from a well-shuffled deck of 52 playing cards. A card is drawn at random from the remaining pack. Find the probability of drawing a. (i) a king (ii) a black card (iii) a face card	4
25	Solve : $\frac{2y}{y-4} + \frac{2y-5}{y-3} = \frac{25}{3}$; $y \neq 3, 4$.	4
26	A child prepares a poster on "SAVE ENERGY" on a square sheet whose each side measures 50 cm. At each corner, she draws a quadrant of a circle of radius 5 cm and at the middle, a circle of diameter 10 cm as shown in the figure. Find the area of the shaded portion. What value is depicted by the child ? (Use $\pi = 3.14$)	4
		
27	If A (3, 0), B (4, 5), C (-1, 4) and D (-2, -1) are four points in a plane, show that ABCD is a rhombus but not a square.	4

28	 <p>The tangent at a point P on a circle with centre O meets the extended diameter BOA at T. If $\angle PBO = 30^\circ$, prove that ΔAPT is isosceles.</p>	4
29	 <p>A model of a traffic signal on the road has a triangular base ABC with $\angle A = 90^\circ$ and with a red circular light within it as shown in the figure. If $AB = 12$ cm and $BC = 20$ cm and R is the incentre of the ΔABC, find the area used for the red light.</p>	4
30	<p>The inner circumference of a circular track is 440 m. The track is 14 cm wide. Find the cost of levelling it at 20 paise/sq m. Also find the cost of putting up fencing along outer circle at ₹ 2/metre.</p>	4
26	<p>From the top of a building, 15 m high, the angle of elevation of the top of a tower is found to be 30°. From the bottom of the same building, the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower and the distance between the tower and building.</p>	4
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