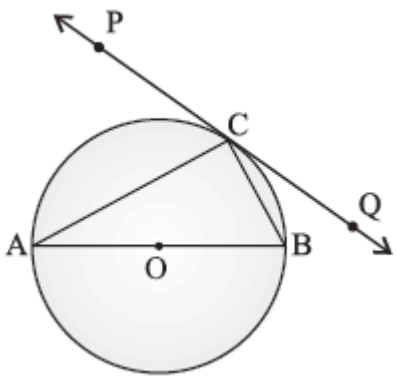
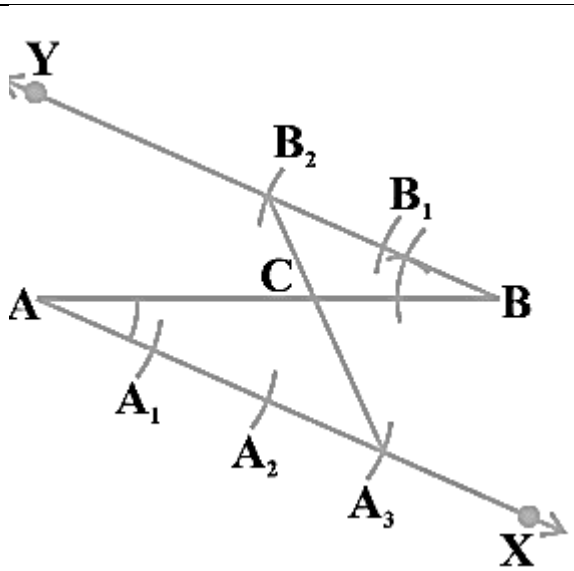
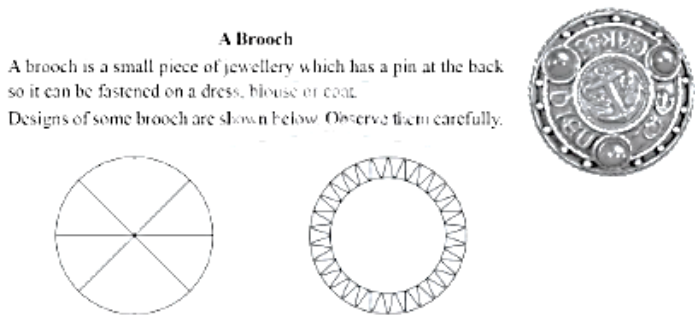
INDIAN SCHOOL AL WADI AL KABIR

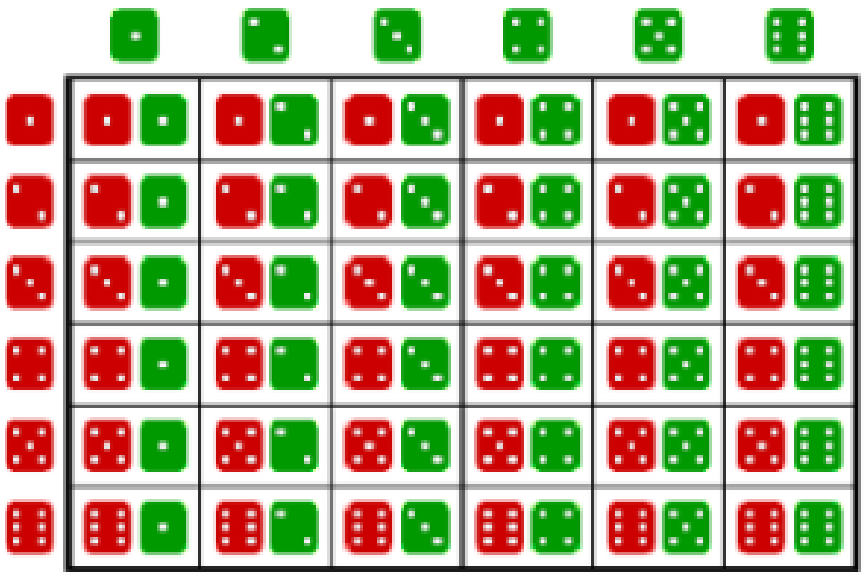
Class: X	Department: MATHEMATICS	Date: 30-12-2020

Sample Paper-3

1 Mark Questions (Q1-Q16)

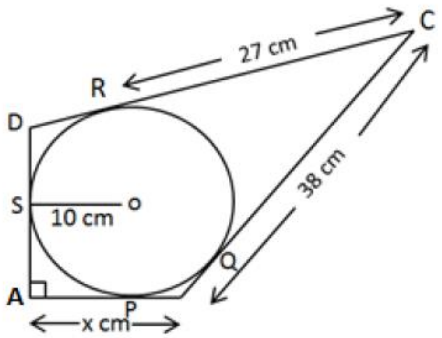
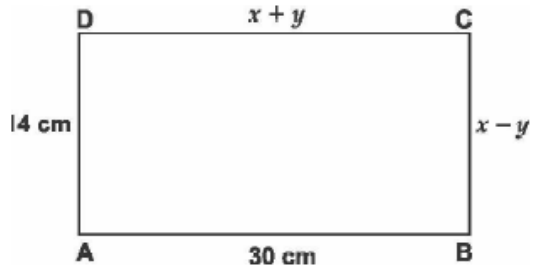
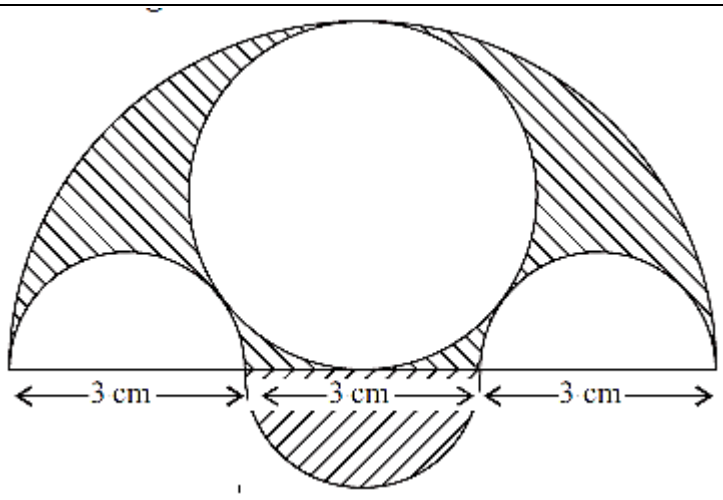
1.	In an AP, if the common difference is –4 and the seventh term is 4, then find the first term.		28
2.	If x = 3 is one root of the quadratic equation $x^2 - 2kx - 6 = 0$, then find the value of k.		k= $\frac{1}{2}$
3.	The ratio of the height of a tower and the length of its shadow on the ground is √3:1. What is the angle of elevation of the sun?		60º
4.	If xy=180 and HCF(x,y)=12, then find the LCM(x,y).		15
5.	If the distance between the points (4, k) and (1, 0) is 5, then what can be the possible values of k?		± 4
6.	In ΔABC, D and E are points on AC and BC respectively such that DE || AB. If AD = 2x, BE = 2x – 1, CD = x + 1 and CE = x – 1, then find the value of x.		x= $\frac{1}{3}$
7.	If empirical relationship between mean, median and mode is expressed as mean = k(3 median – mode), then find the value of k.		k= $\frac{1}{2}$
8.	In a circle of diameter 42cm, if an arc subtends an angle of 60° at the centre where $\pi=\frac{22}{7}$, then what will be the length of arc.		11cm
9.	In figure, PQ is a tangent at a point C to a circle with centre O. If AB is a diameter and ∠CAB = 30°, find ∠PCA.		60º

10.	Two different dice are tossed together. Find the probability that the product of two numbers on the top of the dice is 6.	$\frac{1}{9}$
11.	If cosec $\theta = \frac{5}{4}$, find the value of cot θ.	$\frac{3}{4}$
12.	State the fundamental Theorem of Arithmetic.	
13.	For what value of k, the pair of linear equations 3x+y=3 and 6x+ky = 8 does not have a solution	k=2
14.	In the figure, if B1, B2, and A1,A2, A3 have been marked at equal distances. In what ratio C divides AB? 	3:2
15.	Find the probability of getting a doublet in a throw of a pair of dice.	$\frac{1}{6}$
16.	A horse tied to a pole with 28m long rope. Find the perimeter of the field where the horse can graze. (Take $\pi = \frac{22}{7}$)	
	Case study based questions (Q17- Q20)	
17.	 **Brooch** A brooch is a large, ornamental pin used to secure a cloak at the shoulder. Brooches are decorative pieces of jewelry that attach to clothing with a sharpened metal wire on the back.	

	Brooch A is made with silver wire in the form of a circle with diameter 28 mm. The wire is also used in making 4 diameters which divide the circle into 8 equal sectors as shown in Figure. Brooch B is made in two colours- Gold and Silver. Outer part is made with gold. The circumference of the silver part is 44mm and the gold part is 3mm wide everywhere. **Refer to design A** (a)The total length of silver wire required is (i) 180mm (ii) 200mm (iii)250mm (iv)280mm	(ii)
	(b) the area of each sector of the brooch is (i) 44mm² (ii) 52mm² (iii)77mm² (iv) 68mm²	(iii)
	Refer to design B (c) area of gold part is (i) 150.24mm² (ii) 160.14mm² (iii) 170mm² (iv) 155mm²	(ii)
	(d) circumference of the gold part is (i) 62.8mm (ii) 31.4mm (iii) 3.14mm (iv)6.28mm	(i)
18.	**Rolling 2 dice** The most common type of a die is a six-sided cube with the numbers 1-6 placed on the faces. The value of the roll is indicated by the number of "spots" showing on the top.  (a)Two dice are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is 8? (i) $\frac{1}{36}$ (ii) $\frac{1}{6}$ (iii) $\frac{5}{36}$ (iv) $\frac{8}{36}$	(iii)

	(b)Two dice are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is less than or equal to 12? (i) $\frac{1}{6}$ (ii) $\frac{5}{6}$ (iii) 0 (iv) 1	(iv)
	(c)Two dice are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is 13? (i) $\frac{1}{6}$ (ii) $\frac{5}{6}$ (iii) 0 (iv) 1	(iv)
	(d)Two dice are thrown at the same time. What is the probability that 5 will come up at least once? (i) $\frac{11}{36}$ (ii) $\frac{1}{6}$ (iii) $\frac{5}{6}$ (iv) $\frac{5}{36}$	(i)
19,	 **Taj Mahal- Agra** Mathematics teacher of your school had organized an educational trip to Taj Mahal- Agra. The teacher had interest in history as well. She narrated the facts of Taj Mahal to students .She showed the students combinations of solid figures. There are four minarets cylindrical in shape and stand at the four corners of Taj Mahal. There is a hemispherical dome of radius 35m above a height of 7m	
	(a)Write the formula to find the volume of the hemispherical portion (i) $\frac{2}{3}\pi r^3$ (ii) $\frac{4}{3}\pi r^3$ (iii) $\frac{2}{3}\pi r^2 h$ (iv) $\frac{4}{3}\pi r^2 h$	(i)

	(b)Find the volume of the hemispherical dome of the Taj Mahal considering the radius as 35m (i)89833.33m^3 (ii)49258.44m^3 (iii)369500m^3 (iv)266500m^3 (c) what will be the outer surface area of the hemispherical dome of the Taj Mahal considering the radius as 35m (i)770m^2 (ii)6600m^2 (iii)5500m^2 (iv)4400m^2 (d)) what will be the volume of the base of the Taj Mahal upto a height of 7m with length and breadth as 70m each (i)46300m^3 (ii)36900m^3 (iii)34300m^3 (iv)36300m^3	(i) (i) (iii)
20.	**Hit The Target** **Archery** is the sport, or skill of using a bow to shoot arrows. Figure depicts an archery target marked with its five scoring regions from the centre outwards as Gold, Red, Blue, Black and White. The diameter of the region representing Gold score is 21 cm and each of the other bands is 10.5 cm wide.  (a) The area of the region representing gold scoring area is (i)346.5cm^2 (ii)372cm^2 (iii)368.85cm^2 (iii)390cm^2 (b)The radius of the region representing gold and red scoring region is (i)42cm (ii)52.5cm (iii)21cm (iv)44cm (c)The diameter of the archery target is (i)90cm (ii)100cm (iii)105cm (iv)110cm (d)The area of the region representing red scoring area is (i)572.8cm^2 (ii)1039.5cm^2 (iii)940.8cm^2 (iii)1260cm^2	 (i) (iii) (iii) (ii)

	2 Mark Questions (Q21-Q26)		
21.	In the figure, quadrilateral ABCD is circumscribing a circle with centre O and AD⊥AB. If radius of incircle is 10cm, then the value of x is		21cm
22.	In figure, ABCD is a rectangle. Find the values of *x* and *y*.		*x* = 22, *y* = 8.
23.	Find the sum of first 8 multiples of 3.		108
24.	Find a relation between x and y such that the point (x, y) is equidistant from the points (7,1) and (3,5)		x − y =2
25.	If − 5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.		K= $\frac{7}{4}$
26.	Consider Δ ACB, right-angled at C, in which AB = 29 units, BC = 21 units and ∠ ABC = 90º . Determine the value of $cos^2\theta - sin^2\theta$.		$\frac{41}{841}$
	3 Mark Questions (Q27-Q33)		
27.	Three semicircles each of diameter 3 cm, a circle of diameter 4·5 cm and a semicircle of radius 4·5 cm are drawn in the given figure. Find the area of the shaded region		12·37 cm²

28.	Given that √5 is an irrational number. Hence show that 3 + 2 √5 is also an irrational number	
29.	Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of 60° to each other.	
30.	Monthly pocket money of students of a class is given in the following frequency distribution : Pocket money (in ₹) | 100-125 | 125-150 | 150-175 | 175-200 | 200-225 Number of students | 14 | 8 | 12 | 5 | 11 Find mean pocket money.	₹ 158
31.	In an equilateral triangle ABC, D is a point on side BC such that BD $=\frac{1}{3}$ BC. Prove that 9 AD² = 7 AB²	
32.	Prove that the lengths of tangents drawn from an external point to a circle are equal.	
33.	Prove that $\frac{\sin A - \cos A + 1}{\sin A + \cos A - 1} = \frac{1}{\sec A - \tan A}$	
	5 Mark Questions (Q34-Q36)	
34.	Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost. If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but of height 2.8 m and the canvas to be used costs Rs.100 per sq. m. Find amount the associations will have to pay.	₹ 379500
35.	A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of hill as 30°. Find the distance of the hill from the ship and the height of the hill.	10 √3 m 40m
36.	A boat goes 30 km upstream and 44 km downstream 10 hours. The same boat goes 40 km upstream and 55 km downstream in 13 hours. On this information one of the students guessed the speed of the boat in still water as 8.5 km/h and speed of the stream as 3.8 km/h. Do you agree with his guess?	8 km/hr 3 km/hr

All The Best!!!