SUMMATIVE ASSESSMENT - II 2016-17 MATHEMATICS set-1

SECTION - A

1. In fig.1, PQ is a tangent at a point C to a circle with centre O. If AB is a diameter and <CAB = 300, find <PCA.

Figure 1

2. For what value of k will k + 9, 2k -1 and 2k + 7 are the consecutive terms of an A.P. ?

3. A ladder, leaning against a wall, makes an angle of 60C with the horizontal. If the foot of the ladder is 2.5 m away from the wall, find the length of the ladder.

4. A card is drawn at random from a well shuffled pack of 52 playing cards. Find the probability of getting neither a red card nor a queen.
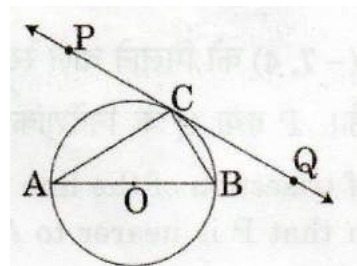
SECTION - B Question numbers 5 to 10 carry 2 marks each.

5. 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.

6. Let P and Q be the points of trisection of the line segment joining the points A(2, - 2) and B(- 7, 4) such that P is nearer to A. Find the coordinates of P and Q.

7. In Fig.2, a quadrilateral ABCD is drawn to circumscribe Q a circle, with centre 0, in such a way that the sides AB, BC, CD and DA touch the circle at the points P, Q, R and S respectively. Prove that. AB + CD = BC + DA.
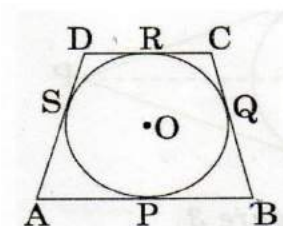

Figure 2

8. Prove that the points (3, 0), (6, 4) and (— 1, 3) are the vertices of a right angled isosceles triangle.

9. The 4th term of an A.P. is zero. Prove that the 25th term of the A.P. is three times its 11th term.

10. In Fig. 3, from an external point P, two tangents PT and PS are drawn to a circle with centre O and radius r. If OP = 2r, show that <OTS = <OST = 30°.
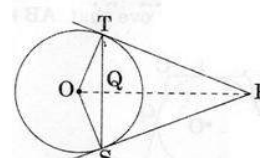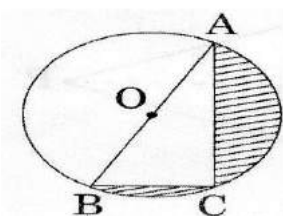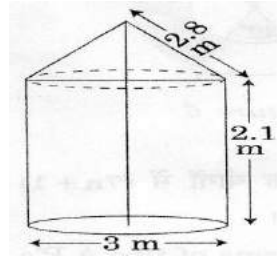

Figure 3

SECTION - C

11. In fig.4, O is the centre of a circle such that diameter AB =13 cm and AC =12 cm. BC is joined. Find the area of the shaded region. (Take π = 3.14)

12. If the point P(x, y) is equidistant from the points A (a +b, b - a) and B(a - b, a + b). Prove that bx= ay.

13. If the ratio of the sum of first n terms of two A.P's is (7n + 1) : (4n + 27), find the ratio of their m^{th} terms.

14. Solve for x : $\frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}$

15. A conical vessel, with base radius 5. cm and height 24 cm, is full of water. This water is emptied into a cylindrical vessel of base radius 10 cm. Find the height to which the water will rise in the cylindrical vessel.

16. A sphere of diameter 12 cm, is dropped in a right circular cylindrical vessel, partly filled with water. If the sphere is completely submerged in water, the water level in the cylindrical vessel rises by $3\frac{5}{9}$ cm. Find the diameter of the cylindrical vessel.

17. Three different coins are tossed together. Find the probability of getting

(i) exactly two heads (ii) at least two heads (iii) at least two tails..

18. In fig. 5, a tent is in the shape of a cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost. of canvas needed to make the tent if the canvas is available at the rate of 500/sq.metre.

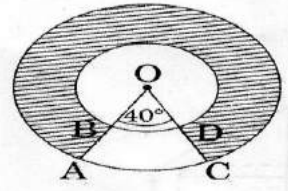19. In fig. 6, find the area of the shaded region, enclosed between two concentric circles of radii 7 cm and 14 cm where <AOC = 40°.

20. 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.

SECTION - D Question numbers 21 to 31 carry 4 marks each

21. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively offered to the state government to provide place and the canvas for 1500 tents to be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8 m and height 3.5 in, with conical upper part of same base radius but of height 2.1 m. If the canvas used to make the tents costs 120 per sq.m, find the amount shared by each school to set up the tents. What value is generated by the above problem? 22. Prove that the lengths of the tangents drawn from an external point to a circle are equal.

23. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of 60° to each other.

24. In Fig. 7, two equal circles, with centres O and O', touch each other at XOO' produced meets the circle with centre O' at A. AC is tangent to the circle with centre O, at the point C. O'D is perpendicular to AC. Find the value of $\frac{CO'}{CO}$
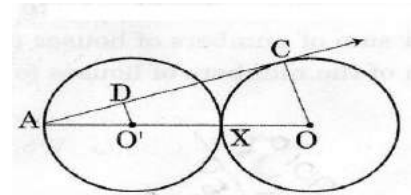
25. Solve for x : $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$

26. The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60°. From a point Y, 40 m vertically above X, the angle of elevation of the top Q of tower is 45°. Find the height of the tower PQ and the distance PX. (Use √3 = 1.73)

27. The houses in a row are numbered consecutively from 1 to 49. Show that there exists a value of X such that sum of numbers of houses proceeding the house numbered X is equal to sum of the numbers of houses following X.

28. In fig. 8, the vertices of ∆ABC are A(4, 6), B(1, 5) and C(7, 2). A line-segment DE is drawn to intersect the sides AB and AC at D and E respectively such that $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{3}$. Calculate the area of ∆ ADE and compare it with area of ∆ ABC.
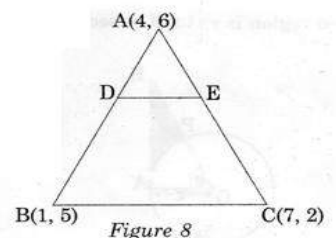
29. A number x is selected at random from the numbers 1, 2, 3 and 4. Another number y is selected at random from the numbers 1, 4, 9 and 16. Find the probability that product of x and y is less than 16.

30. In Fig. 9, is shown a sector OAP of a circle with centre O containing <θ. AB is perpendicular to the radius OA and meets OP produced at B. Prove that the perimeter of shaded region is $r \{tan\theta + sec\theta + \frac{\pi\theta}{180} - 1\}$
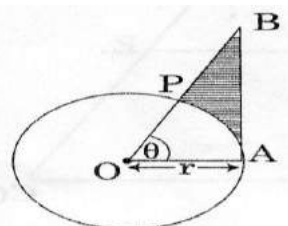
31. A motor boat whose speed is 24 km/h in still water takes 1 hour more to go 32 kin upstream than to return downstream to the same spot. Find the speed of the stream.

SUMMATIVE ASSESSMENT - II (2016-2017) MATHEMATICS Class - X [00EJ4MP]CPS Set-2

SECTION-A

1. Find the 50th term of an AP: –9, –9, –9....

2. A man 1.5 m tall is 23.5 meters away from a tower of height 25 m. From his eyes, find the angle of elevation of the top of the tower.

3. Cards marked with numbers 5 to 75 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that the number on the card is even.

4. Find the ratio in which the line segment joining the points (2, —3) and (3, 1) is divided by x -axis.

Section: B

5. Find the roots of the following quadratic equation: $4x^2 – 4px + (p^2 –q^2) = 0$

6. The seventeenth term of an A.P exceeds its 10th term by 7. Find the common difference.

7. In two concentric circles, a chord of length 24 cm of larger circle becomes a tangent to the smaller circle whose radius is 5 cm. Find the radius of the larger circle.

8. Draw a circle of radius 3.5 cm. From a point 6 cm away from its centre, Construct two tangents to the circle.

9. In the figure, if PQ= PR, prove that QL = RL

10. The difference between the circumference and the diameter of a circle is 30 cm. Find the radius of the circle
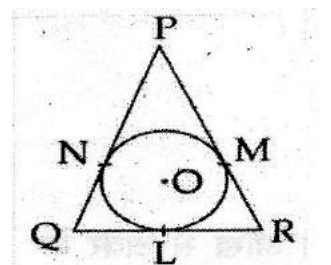
SECTION-C

11. Find the values of k for which the quadratic equation $(k –2)x^2 + 2(2k – 3)x + (5k– 6) = 0$ has equal roots.

12. The sum of n terms of a sequence is $3n^2 + 4n$. Find the nth term and show that the sequence is A.P.

13 Construct a right triangle XYZ in which XY = 5 cm, YZ =12 cm and ZY= 90°. Construct a triangle of similar to it and of factor 4/5

14. A tree 12 m high is broken by the wind in such a way that its top touches the ground and makes an angle 60° with the ground. At what height from the bottom the tree is broken by the wind?

15. A box is containing 55 flash cards showing different numbers on it. If a card is picked up at 3 random from the box, the probability of getting an even number is 1/11 .How many cards have odd numbers written on it ?

16. A (0, 0), B(6, – 2) and C(8,-4) are the three vertices of a parallelogram ABCD. If E is the mid-point of DC, find the area of ∆ADE.

17. If (1, 5), (p, 1) and (4, 11) are collinear, find the value of p.

18 A flower bed is laid in a square park of side 10 m as shown (shaded) in the figure. Find the area of flower bed, if the portions left out are the quadrants of a circle of same radius. The diameter of the circle is equal to side of square.

19. Find the number of coins 1.5 cm in diameter and 0.2 cm thick to be melted
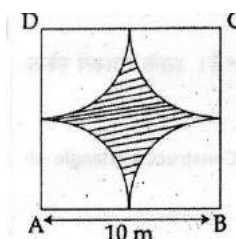
to form a right circular cylinder whose height is 10 cm and diameter is 4.5 cm.

20 Find the mass of a solid cone of silver metal having base diameter 14 cm and vertical height 51 3 22 cm. The density of silver is 10 g/cm3.

SECTION- C

21. Varun takes 6 days less than the time taken by Sachin to finish a piece of work. If both Varun and Sachin together can finish it in 4 days, find the time taken by Sachin to finish the work.

22. Find the sum of the integers between 100 and 200 that are 4 (i) divisible by 6. (ii) not divisible by 6.

23. If the roots of the equation $(a^2 + b^2)x^2 — 2(ac + bd)x + (c^2 + d^2) =0$ are equal, then prove that $\frac{a}{b} = \frac{c}{d}$

24. Prove that the opposite sides of a quadrilateral circumscribing a circle, subtend supplementary angles at the centre of the circle.

25. Construct a AABC in which BC =5 cm, CA = 6 cm and Al3= 7 cm. Construct another triangle A'B'C' each of whose sides are 7/5 times the corresponding sides of $\triangle$ ABC.

26. A person standing on the bank of a river observes that the angle of elevation of the top of a tree on 4 the opposite bank is 60°. When he retires 40 metres from the bank, he finds the angle of elevation to be 30°. Find the width of the river.

27 All kings are removed from a deck of 52 playing cards and then well shuffled. One card is selected 4 from the remaining cards. Find the probability of getting (A) a spade. (B) a queen. (C) a black card. (d) a red ace.

28. The co-ordinates of the vertices of a quadrilateral ABCD are A (0, 5), B (-2, —2), C(5, 0) and D(7, 7). Prove that the quadrilateral ABCD is a rhombus.

29. A manufacturer involves twelve children in colouring pen stands all over excluding base which are in the shape of a cylinder made of wood of thickness 2 cm. The inner radius of the cylinder is 4 cm and its height is 14 cm. Find the area they had to paint if 50 pen stands were given to them for painting. What type of social problem is depicted in the question and measure you will suggest to abolish it?

30. In the given figure, arc A is a 'part of the circle with centre O and radius OP and M is the mid-point of QP. Arc B is a part of a circle with centre M and radius PM. Find the area enclosed between the two arcs A and B. (Take = √3 = 1.73 and π = 22/7]
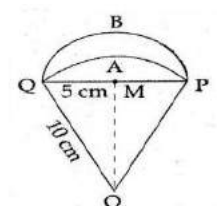
31 A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface area of the remainder is 16/25 of the curved surface area of the whole cone, find the ratio of the line-segments into which the cone's height is divided by the plane.

SUMMATIVE ASSESSMENT - II 2016-17 MATHEMATICS set – 3 [1XNE551]

SECTION - A

1. Find the third term of the following sequence: $a_1 = a_2$; $a_n = a_{n-1} -1$, where n >2

2. The length of the ratio of the of a rod and its shadow is $1:\frac{1}{\sqrt{3}}$ .What is the elevation the angle of source of light ?

3. A die is thrown once Find the probability of getting an odd number.

4. Find the abscissa of the point which divides the join of (-1, 7) and (4. —3) in the ratio 2: 3.

SECTION-B Question numbers 5 to 10 carry two marks each.

5. If one root of the quadratic equation $2x^2 + kx — 6 =0$ is 2, then find the value of k + 1.

6. Find the 7th term from the end of the AP : 32, 37, 42, 47, 237. ..

7. CP, CQ and AB are tangents to a circle with centre O. if CP =11 cm and BR = 4 cm. Find BC.

8. Draw a line segment PQ = 7 cm and locate a point R on PQ such that PR= 3/ 4 PQ.

9. Two circles touch each other externally at C. Prove that the common tangent at C bisects the other two common tangents.
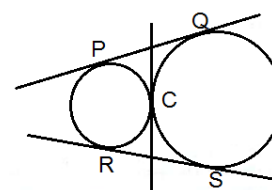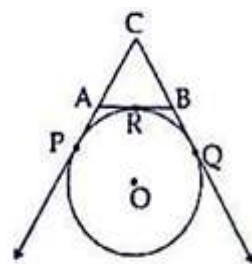
10. A athlete runs on a circular track of radius 40 m and covers a distance of 3080 m along Its boundary. How many rounds has he taken to cover this distance?

SECTION - C Question numbers 11 to 20 carry 3 marks each.

11. Solve the equation : $\sqrt{3x^{-2} - 2}$ = 2x - 1

12. Find the sum of first 25 terms of an AP whose n^{th} term is given by $a_n = 2— 3n$.

13. Construct a triangle PQR with sides PQ = 4 cm, OR = 5 cm and RP= 6 cm. Then, construct another triangle whose sides are 3/4 of the corresponding sides of ∆ PQR.

14. The angle of elevation of the top of a tower from certain point is 30°, if the observer moves 20 metres towards the tower, the angle of elevation of the top increases by 15°. Find the height of the tower.

15. A box is containing 55 flash cards showing different numbers on it. If a card is picked up at random from the box, the probability of getting an even number is 1/11 . How many cards have odd numbers written on it ?

16. If the vertices of a ∆ABC are A(6, - 2), B(0, - 6) and C(4, 8), find the coordinates of mid-points of its sides.

17. The vertices of a triangle are A(3,√3) , D(3, - √3) and C(0, 0). Find its perimeter.

18. The circumference of a circle exceeds the diameter by 16.8 cm. Find the radius of the circle.

19. A hemispherical depression of largest possible diameter is cut out from one face of a conical wooden box of edge . Determine the volume of the remaining solid

20. A plot of land is in the form of a rectangle of dimensions 240 m x180 m. A drainlet 10m wide is dug all around it and the earth dug out is evenly spread over the plot, increasing its surface level by 25cm.Find the depth of the drainlet

SECTION-D. Question numbers 21 to 31 carry 4 marks each.

21. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the difference of its distances from two diametrically opposite gates A and B on the boundary is 7 metres. Is it possible to do so ? If yes, at what distances from the two gates should the pole be erected?

22. The 6th term of an AP is zero. Prove that its 21th term is triple its 11th term.

23. If the equation $(1 + m^2)x^2 + 2mcx + (c^2 - a^2)$ has equal roots, prove that $c^2 = (a^2 + m^2)$

24. Two tangents are drawn to a circle with centre O, from a point P. If OP is equal to the diameter of the circle, show that $\triangle APB$ is equilateral.

25. Construct an $\triangle ABC$ in which AB = 6 cm, <B = 60° and AC = 7 cm. Construct a triangle similar to $\triangle ABC$, whose sides are 4/7 of the corresponding sides of $\triangle ABC$.

26. The angle of elevation of a jet fighter from a point O on the ground is 60^0 • After a flight of 15 sec , the angle of elevation changes to 30°.If the jet is flying at a speed of 720 km/h, Find the constant height at which jet is flying.
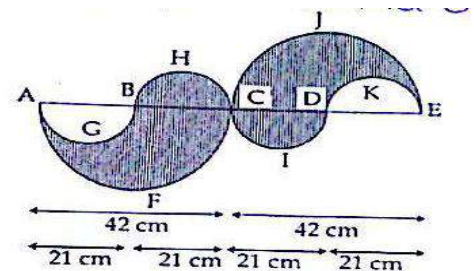
27. Ten playing card – 4 aces, 2 red queens, a king of spade, a jack of club and 5 and 6 of diamonds, are well shuffled and are kept with their faces downwards. One card is then picked up random.

(i) What is the probability that the card is an ace?   (ii) What is the probability of drawing a red card?

(iii) What is the probability that the card is a jack of club?

28. If the point P (3, 4) is equidistant from the points A (a + b. b - a), B (a - b, a + b), then prove that 3b – 4a = 0.

29. An NCO has decided to start it campaign about the consumer services, to spread awareness about the consumer courts and their benefits. For the same purpose, it makes some badges in the shape as shown in the figure, such that AB = BC = CD = DE = 21 cm. Find the area and perimeter of the badge (shaded region.) How consumer courts are helpful for the society?

30. The length of the minute and hour hands of a clock are 14 cm and 10.5 cm respectively. Find the difference in areas of the sectors described by the hands between 8 am and 8.40 am.

31. A cone, a hemisphere and a cylinder stand on equal bases and have same heights as the radii of the bases, Show that their volumes are in the ratio 1: 2: 3.
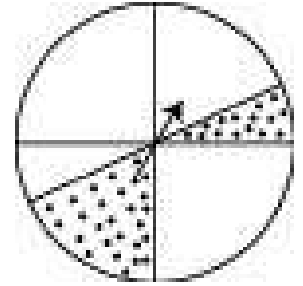
SECTION - A

1. Find the 19th term of the following sequence:

$$t_n = \begin{cases} n^2, \text{where } n \text{ i even} \\ n^2 - 1, \text{where } n \text{ is odd} \end{cases}$$

2. A pole of light is 50 m high from which angle of depression of a ship is 30^0. Find the distance of the ship from the pole.

3. A spinner shown here is rotated once. What is the probability that the arrow will stop at the shaded region ?

4. Determine the vertex which contains a right angle in $\triangle ABC$, where A (4, -2), B (7, 9) and C(7, -2)

SECTION-B Question numbers 5 to 10 carry two marks each.

5. One day, I asked the son of my close friend about his age. The child replied in a different way: He said," One year ago, my dad was 8 times as old as me and now his age (in years) is equal to the square of my age ". Represent the above situation in the form of a quadratic equation.

6. How many multiples of 4 lie between 10 and 260 ?

7. PQ and PR are two tangents drawn from an external point P to a circle with centre O. Prove that QORP is a cyclic quadrilateral.

8. Two circles touch internally at P. How many tangents can be drawn to the circles from an external point ? What is the relation between the tangents ?

9. Draw a circle of radius 3.5 cm. From a point 6 cm away from its centre, Construct two tangents to the circle.

10. If the radii of the circular bases of a frustum of a cone are 33cm and 27 cm and its slant height is 10cm, find the height of the frustum.

SECTION – C Question numbers 11 to 20 carry 3 marks each.

11. If the quadratic equation $(1 + a^2)b^2x^2 + 2abcx + (c^2 - m2) = 0$ in x has equal roots, prove that $c^2 + m^2 (1 + a^2)$.

12. If the 19th term of an AP is 47, then find the sum of the first 37 terms.

13. ABC is a triangle. A circle touches sides AB and AC produced and side BC at X, Y and Z respectively. Show that $AX = \frac{1}{2} Perimeter \ of \ \triangle ABC$.

14. Find the area of the shaded region in the given figure

15. How many times do you expect to get 6 when a die is thrown 60 times ?

16. Find the value of k, if the point P(1, 3) is equidistant from the points $A(k, 7) \ and \ B (-9, k)$.

17. The line segment joining the points $(3, 6)$ and $(9, -3)$ is trisected at the points P and Q. If P lies on the line $3x - 2y - k = 0, find \ the \ value \ of \ K$
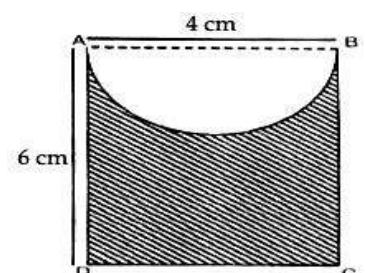
18. A tree 12 m high is broken by the wind in such a way that its top touches the ground and makes an angle 60^0 with the ground. At what height from the bottom the tree is broken by the wind?

19. Four hollow cubical boxes each having outer edge 1 m are joined to form a double bed in which top face is a square. If the wood used is of thickness 5 cm and all the four boxes can be opened, then what is the capacity of the boxes of the double bed in cubic metres ?

20. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding minor segment. (Use $\pi = 3.14$)

SECTION - D Question numbers 21 to 31 carry 4 marks each.

21. Solve : $\frac{2y}{y-4} + \frac{2y-5}{y-3} = \frac{25}{3}$

22. Find the sum of all natural numbers amongst first one thousand numbers which are neither divisible by 2 nor by 5.

23. Find the roots of the quadratic equation $4x^2 + 4bx - (a^2 - b^2) = 0$ by the method of completing the square.

24. AC is a chord of a circle with centre O. The tangents at C to the circle meets extended diameter AB at D. Show that BD = BC, if < D = < A.

25. Construct a $\triangle$ ABC whose sides are in the ratio 2 : 3 : 4 and perimeter 12 cm. Now construct $\triangle$ A'BC' similar to $\triangle$ ABC such that $A'B = \frac{2}{5} AB$.

26. There are two temples, one on each bank of a river, just opposite to each other. One temple is 50 m high. From the top of this temple, the angles of depression of the top and the foot of the other temple are 30^0 and 60^0 respectively. Find the width of the river and the height of the other temple.

27. Card marked with numbers 1, 3, 5, - - - - - - 103, are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the number on the drawn card is :

(i) at least 87 (ii) less than 23

28. The co-ordinates of the vertices of a quadrilateral ABCD are A (0, 5), B (- 2, - 2), C(5, 0) and D(7, 7). Prove that the quadrilateral ABCD is a rhombus.

29. Mrs. Rajani has a garden in the shape of an equilateral triangle. She divided it into four parts by drawing three circular parts at the vertices of the triangle with radii each equal to the half of side of triangle for growing vegetables and flowers using Bio fertilizers. The area of the triangle is 144√3 m2. Find the area of part of the triangle not included in the circular parts. How Bio fertilizers are helpful over chemical fertilizers?

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.

31. A cone, a hemisphere and a cylinder stand on equal bases and have same heights as the radii of the bases. Show that their volumes are in the ratio 1 : 2 : 3.

SECTION-A Question numbers 1 to 4 carry one mark each.

1. If one root of the equation $2x^2 - 10x + p = 0$ is 2 then find the value of p.

2. A pole 6 in high casts a shadow $2\sqrt{3}$m long on the ground. What is the elevation of the source of light

3. One card is drawn from a well shuffled deck of 52 playing cards. Find the probability that card is not a red queen.

4. Find the distance of the point (3, 27) from the point (5, 27).

SECTION-B

Question numbers 5 to 10 carry two marks each.

5. Find the value of k such that 5/2 is a root of the quadratic equation $14x^2 - 27x + k = 0$

6. Ram Prasad saved Rs.10 in the first week of a year and then increased his weekly savings by Rs.2.75. if in the nth week, his savings become Rs.59.50, find n.

7. P Q is a chord of a circle and R is point on the minor arc. If PT is a tangent at point P such that <QPT=600 Find <PRQ

8. Draw a circle of radius 33 cm. From a point 6cm away from Its centre, Construct two tangents to the circle.

9. In the adjoining figure PQ and PR are tangents from P to a circle with centre O. If <POR =550 find <QPR.
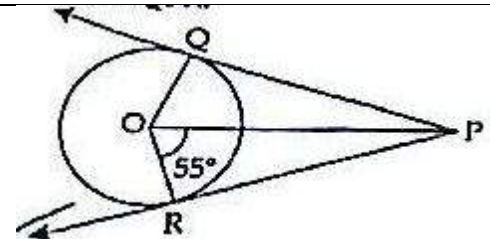
10. Three metallic solid cubes whose edges are 3 cm, 4 cm and 5 cm are melted and formed into single cube. Find the diagonal of the cube so formed.

SECTION-C Question numbers 11 to 20 carry 3 marks each.

11. The area of a right - angled triangle is 600 sq. cm. If the base of the triangle exceeds the altitude by 70 cm, find the dimensions of the triangle.

12. The 8th term of an AP Zero. Prove that its 38th term is triple of its 18th term.

13. Two concentric circles with centre O are given. PAC Is a secant and AC is the chord to the larger circle which touches the smaller circle at B. If length of tangent CQ is 5 cm, PA = 7 cm and OP =13 cm, find the radius of the smatter circle.

14. The horizontal distance between two towers Is 60rn. The angle of elevation of the tap of the taller tower as seen from the top of the shorter one is 300, if the height of the taller tower is 150 rn, then find the height of the shorter tower.

15. Two fair dice are rolled simultaneously. What is the probability that the sum of the numbers obtained is a multiple of 3?

16. If the points A(0,1),B(6, 3) and C(x, 5) are the vertices of a triangle, find the value of x such that area of $\triangle$ ABC = 10.
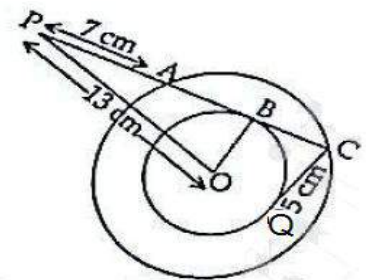
17. The coordinates of the vertices ΔA,B and C of a parallelogram ABCD are (2,21),(3,4) ,(22, 3) respectively. Find the coordinates of the fourth vertex D.

18. In the given figure, find the area of the shaded portion. Given that AOBCA is a quadrant of a circle with centre O and radius 35 cm and OD = 21 cm.
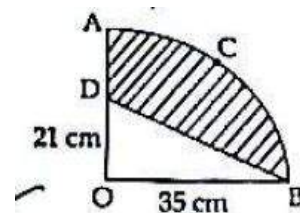
19. The cost of painting the total outside surface of a closed cylindrical oil tank at 60 praise per sq. m is Rs.237.60 and the height of the tank is 6 times the radius of the base of the tank. Find radius and height of the tank.

20. The area of a circular playground is 22176 m2. Find the cost of fencing this ground at the rate of 115.50 per meter.

SECTION - D Question numbers 21 to 31 carry 4 marks each.

21. Solve for x : $\frac{2y}{y-4} + \frac{2y-5}{y-3} = \frac{25}{3}$

22. The angles of a triangle are in A.P. If the greatest angle is twice the least, and find all the angles?

23. The hotel bill for a number of people for overnight stay is Rs. 4,800. If for the same amount there were 4 more people, the bill each person had to pay would have reduced by Rs. 200. Find the number of people staying overnight.

24. In the given figure, O is the centre of two concentric circles of radii 5 cm and 3 cm. From an external point P tangents PA and PB are drawn to these circles. It PA = 12 cm, then find perimeter of quad PAOB.
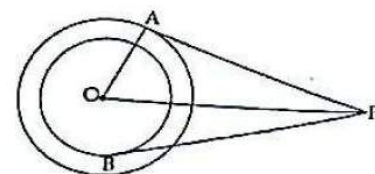
25. Construct Δ DEF~ Δ ABC in which AB = 5.2 cm < B= 45° and

BC = 6cm, using scale factor 1: 2.

26. The angle of elevation of the top B of a tower AB from a point X on the ground is 60^0. At a point Y, 40m vertically above X, the angle of elevation of the top is 45^0. Find the height of the tower AB and the distance XB

27. A die is thrown twice. Find the probability that:

 (i) the number 4 tails to come up either time. (ii) the number 4 comes up exactly once.

28. Prove that the points A(0,0), B(0,2) and C(2, 0) are the vertices of an isosceles right triangle. Also, find its area.

29.A brooch is made with silver wire in the form of a circle with diameter 35 mm for the inauguration of a Social club in a Social club to keep environment clear in its neighbourhood. The wire also used in making 5 diameters which divide the circle into 10 equal sectors. Find

(i) Total length of the silver wire required. (ii) The area of each sector of the brooch.

(iii) How can you help to keep envinanrnent pollution free?

30. A circular plot has a perimeter of 660 m. A plot in the shape of a square has its vertices on the boundary of the circular plot. Find the area of the square plot.

31. Water flows through a cylindrical pipe, whose inner diameter is 7 cm, at the rate of 6 km/h in an empty cylindrical tank, the radius of whose base is 40 cm and height is 4.9m. How long will it take to fill the whole tank?

# SUMMATIVE ASSESSMENT - II 2016-17 MATHEMATICS set – 6[Y6I7ZNS]

SECTION - A Question numbers 1 to 4 carry one mark each.[cps qp]

1. Is - 150 a term of the A.P. :11, 8, 5, 2, …. ?

2. The angle of elevations of a building from two points on the ground 9 m and 16 m away from the foot of the building are complementary. Find the height of the building.

3. A die is thrown once. Find the probability of getting a number which has at least 2 factors.

4. If the line segment joining the points P and Q (3, - 4) is bisected at origin, find the coordinates of P.

SECTION - B Question numbers 5 to 10 carry two marks each.

5. One day, I asked the son of my close friend about his age. The child replied in a different way : He said," One year ago, my dad was 8 times as old as me and now his age (in years) is equal to the square of my age ". Represent the above situation in the form of a quadratic equation.

6. If the sum of first m terms of an AP is $am^2 + bm$, find its common difference.

7. If PA and PB are two tangents drawn to a circle with centre O, from an external point P such that PA = 2.8 cm and $<APB = 60^0$. Find the length of chord AB.

8. In the figure, Δ DE'F' is equilateral having side 5 cm. What will be the side of ΔDEF, where D_1, D_2, D_3, …. are points at equal distances on ray DX and D_3E' II D_5E and E'F' II EF
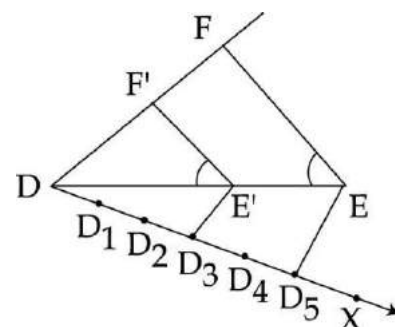
9. Draw tangents to a circle of radius 6 cm from a point P at a distance of 10 cm from its centre.

10. The diameter and height of a cylinder and a cone are equal. Find the volume of each also, find the ratio of their volume.

SECTION-C Question numbers 11 to 20 carry 3 marks each

11. Find the roots of the equation $6x^2 + 7x – 10 = 0$ by the method of completing squares.

12. In the figure, QR is a tangent at Q to a circle, whose centre is P. PR II AQ, where AQ is a chord through A, an end point of the diameter AB. Prove that BR is tangent at B.
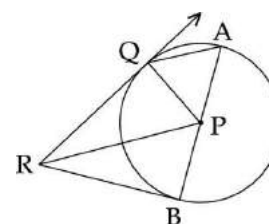
13. Find the sum of the first 30 terms of an AP whose nth term is 2 - 3n.

14. The angle of elevation of the top of a hill from the foot of a tower is 60^0 and the angle of elevation of the top of the tower from the foot of the hill is 30^0. If the tower is 50 m high, find the height of the hill.

15. Two fair dice are rolled simultaneously. What is the probability that the sum of the numbers obtained is a multiple of 3 ?

16. The coordinates of one end point of a diameter of a circle are (7, 9). If the coordinates of the centre are (10, 10), find the coordinates of the other end point of the diameter.

17. If the point (x, y) is equidistant from the points (a - b, a + b) and (- a - b, a + b), prove that x - a = 0

18. Area of a sector of a circle with angle 300 is 8 square units. Find the area of the circle. Also, find the radius of this circle.

19. The sum of the radius of the base and height of a solid cylinder is 37 cm. The total surface area of the solid cylinder is 1628 cm². It is melted to form a sphere, find the volume of the sphere.

20. The area of a circular playground is 22176 m2. Find the cost of fencing this ground at the rate of Rs.50 per metre.

SECTION - D   Question numbers 21 to 31 carry 4 marks each.

21. Find the positive value of k for which $x^2 + kx + 64 = 0 \ and \ x^2 - 8x + k = 0$ will have real roots.

22. If the numbers a, b, c, d and e are in an A.P. then prove that $a - 4b + 6c - 4d + e = 0$

23. Solve for x: $\dfrac{1}{a+b+x} = \dfrac{1}{x} + \dfrac{1}{b} + \dfrac{1}{a}$

24. Two circles with centres O and O' of radii 3 cm and 4 cm, respectively intersect at two points P and Q such that OP and O'P are tangents to the two circles. Find the length of the common chord PQ.

25. Construct $\triangle$ PQR ~ $\triangle$ABC in which AB = 6.2 cm, BC = 5.4 cm and AC = 4 cm, using scale factor $\frac{1}{3}$.

26. There are two temples, one on each bank of a river, just opposite to each other. One temple is 50 m high. From the top of this temple, the angles of depression of the top and the foot of the other temple are 30° and 60° respectively. Find the width of the river and the height of the other temple.

27. Three digit numbers are made using the digits 1, 3 and 4 (without repetition of digits). If a number among them is selected at random, what is the probability that the number will (i) be even? (ii) Be odd (iii) end with zero? (iv) Be a multiple of 3?

28. Show that the points $(1,7), (4,2), (-1,-1) \ and \ (-4,4)$ are the vertices of a square. Also, find the area of this square.

29. A manufacturer involves twelve children in colouring pen stands all over excluding base which are in the shape of a cylinder made of wood of thickness 2 cm. The inner radius of the cylinder is 4 cm and its height is 14 cm. Find the area they had to paint if 50 pen stands were given to them for painting. What type of social problem is depicted in the question and measure you will suggest to abolish it?

30. A horse is placed for grazing inside a rectangular field 70 m by 52 m and is tethered to one corner by a rope 21 m long. On how much area it cannot graze?

31. The volume of a solid iron sphere is $\dfrac{2048}{3}\pi$ cm³. This sphere is melted and eight rings of iron plates of external radii $6\frac{2}{3}$ cm and thickness 3 cm are made. Find the internal radius of each ring.