APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 1

CLASS: X **MATHEMATICS**

STATISTICS

SECTION A

1. Find the class marks of classes 15.5 – 18.5 and 50 – 75.
2. Find the mean of first seven multiples of 11.
3. A data has 13 observations arranged in descending order. Which observation represents the median of data?
4. If the mode of a distribution is 16 and its mean is 5, then find the median.
5. Consider the following frequency distribution.

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	3	9	15	30	18	5

6. Find the median class of the following distribution.

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Frequency	4	4	8	10	12	8	4

SECTION B

1. Find the mode of the following data:

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of students	8	20	45	58	70

2. The following table shows the weight (in gms) of a sample of 100 apples taken from a large consignment.

Weight (in gms)	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100	100 – 110	110 - 120	120 - 130
No. of apples	8	10	12	16	18	14	12	10

Find the median of the above data.

3. Find the mean of the following frequency distribution.

Class Interval	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
No. of workers	15	18	21	29	17

4. The mean of the following frequency distribution is 62.8. Find the missing frequency 'x'.

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 - 120
Frequency	5	8	x	12	7	8

5. If the median of the following data is 240 then find the value of 'f'.

Class Interval	0 – 100	100 – 200	200 – 300	300 – 400	400 – 500	500 – 600	600 – 700
Frequency	15	17	f	12	9	5	2

SECTION C

1. The distribution below gives the marks of 100 students of a class.

Marks	0 – 5	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 - 35	35 – 40
No. of students	4	6	10	10	25	22	18	5

Draw a less than type and a more than type ogive from the given data. Hence, obtain the median marks from the graph.

2. The mean of the following frequency distribution table is 50. But the frequencies f_1 and f_2 in class 20 – 40 and 60 – 80 respectively are missing. Find the missing frequencies.

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	Total
Frequency	17	f_1	32	f_2	19	120

3. 50 students enter for a school javelin throw competition. The distance (in metres) thrown are recorded below:

Distance (in m)	0 – 20	20 – 40	40 – 60	60 – 80	80 - 100
No. of students	6	11	17	12	4

(i) Construct a cumulative frequency table.

(ii) Draw a cumulative frequency (less than type) curve and calculate the median distance thrown by using this curve.

(iii) Calculate the median distance by using the formula for median.

(iv) Are the median distances calculated in (ii) and (iii) same?

4. Find the mean, mode and median of the following frequency distribution for 100 calls made on a mobile phone.

Distance (in seconds)	95 – 125	125 – 155	155 – 185	185 – 215	215 – 245
No. of calls	14	22	28	21	15

5. The annual profits earned by 30 shops of a shopping complex in locality give rise to the following distribution.

Profit (in lakhs in Rs)	**No. of shops (frequency)**
More than or equal to 5	30
More than or equal to 10	28
More than or equal to 15	16
More than or equal to 20	14
More than or equal to 25	10
More than or equal to 30	7
More than or equal to 35	3

Draw both ogives for the above data and hence obtain the median.

6. During the medical check-up of 35 students of a class, their weights are recorded as follows:

Weight (in kg)	**No. of students**
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive for the given data. Hence, obtain the median weight from the graph and verify the result by using the formula.

****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 2

CLASS: X **MATHEMATICS**

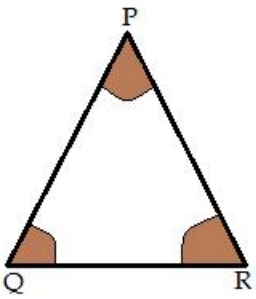
AREAS RELATED TO CIRCLES

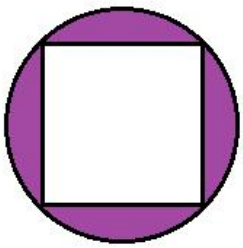
SECTION A

1. The diameter of a wheel is 1.54 m. How far will it travel in 200 revolutions?
2. The circumference of a circle exceeds the diameter by 17.12 cm. Find the area of the circle (Use $\pi = 3.14$)
3. The area between two concentric circles is 346.5 cm^2 and the circumference of the inner circle is 88 cm. Calculate the radius of the outer circle. (Use $\pi = \frac{22}{7}$)
4. The area of a circular playground is 44506 m^2. Find the cost of fencing the ground at the rate of ₹50 per metre.
5. The inner circumference of a circular track is 22 cm. The track is 7 m wide. Calculate the cost of putting a fence along the outer circle at ₹200 per m.

SECTION B

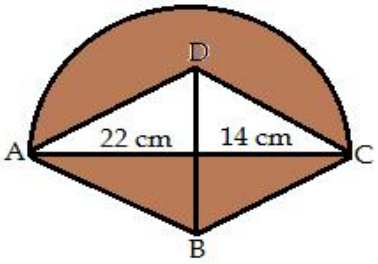
1. An athlete runs on a circular track of radius 49 m and covers a distance of 3080 m along its boundary. How many rounds has he taken to cover this distance? (Use $\pi = \frac{22}{7}$).
2. A sector is cut off from a circle of radius 21 cm. The angle of the sector is 120°. Find the length of its arc and the area. (Use $\pi = \frac{22}{7}$)
3. A horse is tethered at the centre of a rectangular field 40 m × 30 m by a rope 14 m long. Find the area of the field over which it cannot graze.
4. In the given figure, arcs have been drawn with radii 14 cm each and with centre P, Q and R. Find the area of the shaded region.
5. A square of diagonal 8 cm is inscribed in a circle. Find the area of the shaded region.



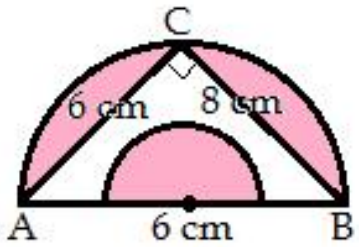


SECTION C

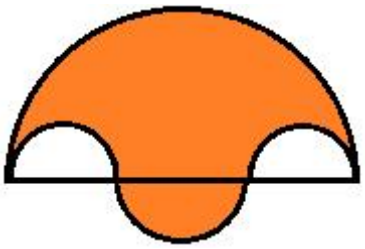
1. ABCD is a rhombus whose diagonals are 22 cm and 14 cm. A semicircle is drawn with diameter AC as shown in the diagram. Find the area of the shaded region.



2. The given figure shows a semicircle with AB as diameter. A triangle ABC is drawn inside the semicircle. Another semicircle of diameter 6 cm is also drawn. Find the area of the shaded region.

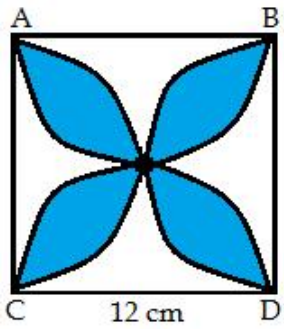


3. In the given figure, the boundary of shaded region consists of four semicircular arcs, two smallest being equal. If diameter of the largest is 14 cm and that of the smallest is 3.5 cm, calculate the area of the shaded region.

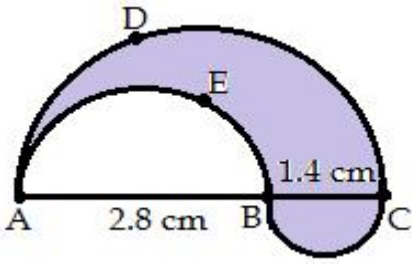


(Use $\pi = \frac{22}{7}$)

4. Find the area of the shaded design in the figure where ABCD is a square of side 12 cm and semicircles are drawn with each side of the square as diameter. (Use $\pi = 3.14$)



5. Find the perimeters of the shaded region, where ADC, AEB and BFC are semicircles on diameters AC, AB and BC respectively.



****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 3

CLASS: X **MATHEMATICS**

PROBABILITY

SECTION A

1. If the probability of winning a game is 0.7, what is the probability of losing it?
2. In a lottery there are 10 prizes and 25 blanks. What is the probability of getting a prize?
3. A card is drawn at random from a well-shuffled pack of 52 cards. Find the probability of getting a red king.
4. In a single throw of two dice, find the probability of getting a doublet.
5. In rolling two fair dice, what is the probability of obtaining a sum greater than 3 but not exceeding 6?

SECTION B

1. In a family of 3 children, find the probability of having at least one boy.
2. A card is drawn at random from a well-shuffled pack of 52 cards. Find the probability that the drawn card is neither a king nor a queen.
3. Two different dice are rolled simultaneously. Find the probability the sum of the numbers on the two dice is 10.
4. Two dice are rolled together. Find the probability of getting such numbers on two dice whose product is 12.
5. A lot consists of 144 ball point pens of which 20 are defective and others good. Tanvi will buy a pen if it is good, but will not buy it if it is defective. The shopkeeper draws one pen at random and gives it to her. What is the probability that (i) she will buy it (ii) she will not buy it?
6. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, find the number of blue balls in the bag.
7. A bag contains 12 balls out of which x are white.
   (i) If one ball is drawn at random what is the probability that it will be white ball?
   (ii) If 6 more white balls are put in the bag the probability of drawing a white ball will be double than that in (i), find x.
8. What is the chance that a leap year, selected at random, will contain 53 Sundays?
9. From a well shuffled pack of 52 cards, three kings and one ace are removed. From the remaining cards, a card is drawn at random. Find the probability that the drawn card is neither a jack nor a queen.
10. A jar contains 24 marbles. Some of these are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. Find the number of blue marbles in the jar.

SECTION C

1. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is
   (i) a card of space or an ace (ii) a red king
   (iii) neither a king nor a queen (iv) either a king or queen

2. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is

   (i) an even number (ii) a number less than 14

   (iii) a number which is a perfect square (iv) a prime number less than 20

3. Three coins are tossed. Find the probability of

   (i) all heads (ii) exactly 2 heads (iii) at least 2 heads

   (iv) at most 2 heads (v) no head

4. A bag contains 5 red balls, 7 white balls, 5 green balls and 8 black balls. One ball is drawn at random from the bag. Find the probability the ball is

   (i) white (ii) red or black (iii) not green (iv) neither white nor black

5. A box contains cards bearing numbers 6 to 70. If one card is drawn at random from the box, find the probability that it bears

   (i) a one-digit number (ii) a number divisible by 5

   (ii) an odd number less than 30 (iv) a composite number between 50 and 70

****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

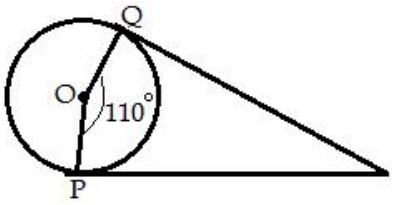
HALF-YEARLY – WORKSHEET 4

CLASS: X **MATHEMATICS**

CIRCLES

SECTION A

1. PA and PB are tangents from an external point P to a circle with centre O. Show that the quadrilateral AOBP is cyclic.
2. In the given figure, if TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 110^\circ$, prove that $\angle PTQ = 70^\circ$.



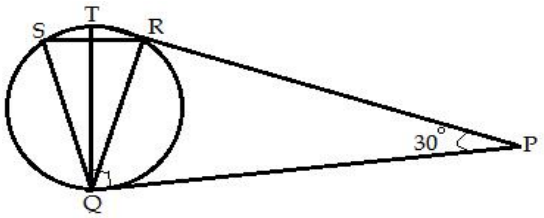
3. LM and LN are tangents from an external point L. At the point C on the arc MN, a tangent AB is drawn terminated by the tangents LM and LN. Show that the perimeter of Δ ABL is constant.
4. From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR to the circle is drawn. Find the area of the quadrilateral PQOR.
5. Prove that the centre of a circle touching two intersecting lines lies on the angle bisector of these lines.

SECTION B

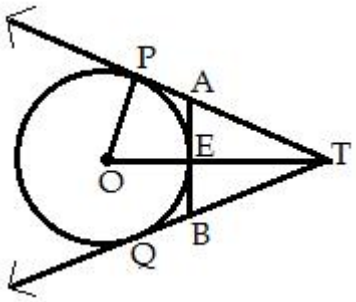
1. A chord PQ of a circle is parallel to the tangent drawn at a point R. Prove that R bisects the arc PRQ.
2. In the given figure, a circle is inscribed in a triangle ABC having side BC = 8 cm, AC = 10 cm and AB = 12 cm. Find AD, BE and CF.
3. If angle between two tangents drawn from a point P to a circle of radius *a* and centre O is 90˚, then OP = $a\sqrt{2}$.
4. Prove that the length of the tangent drawn from an external point P on a circle with centre O is always less than OP.
5. PA and PB are tangents from P to the circle with centre O. At point M, a tangent is drawn cutting PA at K and PB at N. Prove that KN = AK + BN.

SECTION C

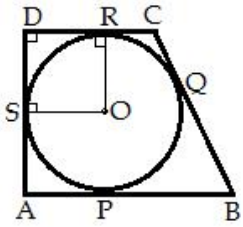
1. Two circles with centre O and O' of radii 3 cm and 4 cm, respectively intersect at two points P and Q such that OP and O'P are tangents to the two circles. Find the length of the common chord PQ.
2. In the given figure, tangents PQ and PR are drawn to a circle such that $\angle RPQ = 30^\circ$. A chord RS is drawn parallel to the tangent PQ. Find $\angle RQS$.



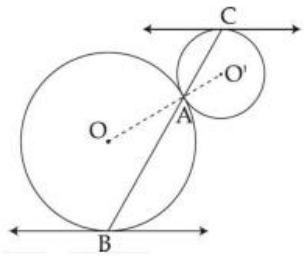
3. In the given figure, O is the centre of a circle of radius 5 cm, T is a point such that OT = 13 cm and OT intersects the circle at E. If AB is a tangent to the circle at E, find the length of AB.



4. ABCD is a quadrilateral such that $\angle D = 90^\circ$. A circle C(O, *r*) touches the sides AB, BC, CD and DA at P, Q, R and S respectively. If BC = 38 cm, CD = 25 cm and BP = 27 cm, then find *r*.



5. In the figure, two circles with centres O and O′ touch each other externally at a point A such that O, O′ and A are collinear. A line through A is drawn to intersect these circles in B and C respectively. Prove that the tangents to these circles at B and C are parallel.



****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 5

CLASS: X **MATHEMATICS**

HEIGHTS AND DISTANCE

SECTION A

1. If the height of a vertical poles is $\sqrt{3}$ times the length of its shadow on the ground. Find the angle of elevation of the sun.
2. From the top of a hill, the angle of depression of two consecutive km stones due east are found to be 30° and 45°. Find the height of the hill.
3. An observer 1.5m tall is 28.5 m away from a tower. The angle of elevation of the top of the tower from her eyes is 45°. What is the height of the tower?
4. If the shadow of a tree is $\frac{1}{\sqrt{3}}$ times the height of the tree, then find the angle of elevation of the sun.
5. A tower is $100\sqrt{3}$ m high. Find the angle of elevation of its top from a point 100 m away from its foot.

SECTION B

6. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. Find the height of the tower.
7. An observer, 2.5m tall is 33.5 away from a tower 30m high. Determine the angle of elevation of the top of the tower the eye.
8. A circus artist is climbing a 40 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angle made by the rope with the ground level is 30°.
9. A kite is flying at a height of 75 m from the ground level, attached to a string inclined at 60° to the horizontal. Find the length of the string to the nearest metre.

SECTION C

11. A tree 12m 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?
12. A ladder 15m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, find the height of the wall.
13. The angle of elevation of an aeroplane from a point on the ground is 60°. After flight of 15 seconds, the angle of elevation changes to 30°. If the aeroplane is flying at a constant height of $150\sqrt{3}$ m, find the speed of the plane in km/hr.

14. Two ships are approaching a lighthouse from opposite directions. The angles of depression two ships from the top of a lighthouse are 30°and 45°. If the distance between the two ships is 100 metres. Find the height of the light house.
15. The angle of elevation of the top of a tower from two points on the ground at distance 'a' metres and 'b' metres from the base of the tower and in the same straight line are complementary. Prove that the height of the tower is $\sqrt{ab}$ metres.

SECTION D

16. The angle of elevation of a cloud from appoint 60 m above a lake is 30° and the angle of depression of reflection of the cloud in the lake is 60°. Find the height of the cloud.
17. A man standing on the deck of a ship, which is 12 m above the water level, observes the angle of elevation of the top of a hill as 60°, and the angle of depression of the base of the hill as 30°. Find the distance of the hill from the ship and the height of the hill.
18. A round balloon of radius r subtend an angle α at the eye of the observer while the angle of elevation of its centre is β. Prove that height of the centre of the balloon is $r\sin\beta\,\text{cosec}\,\frac{\alpha}{2}$.
19. At the foot the mountain, the angle of elevation of its summit is 45°. After ascending 1 km towards the mountain up at an inclination of 30°, the angle of elevation changes to 60°. Find the height of the mountain.
20. From the top of tower the angle of depression of an object on the horizontal ground is found to be 60° on descending 20 m vertically downwards from the top of the tower, the angle of depression of the object is found to be 30°. Find the height of the tower.

****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 6

CLASS: X **MATHEMATICS**

PAIR OF LINEAR EQUATIONS

SECTION A

1. Write the value of k for which the system of equations $x + y - 4 = 0$ and $2x + ky + 8$ has infinitely many solutions.
2. Show that $x = 2$, $y = 1$ is a solution of the system of simultaneously linear equations $3x - 2y = 4$, $2x + y = 5$.
3. Solve $x + y = 10$; $x - y = 4$ by elimination method.
4. Solve $x - y = 1$; $2x + y = 8$ by cross multiplication method.
5. Find the point of intersection of line $-3x + 7y = 3$ with x axis.

SECTION B

1. Check if the given values of x and y are a solution of given pair of equations or not.

   $2x - 3y = 5$; $\frac{x}{4} - 3y = 1$; $x = 4$, $y = 1$.

2. Determine the value of p for which following system of linear equations represents parallel lines
   $(3p + 1)x + 3y - 2 = 0$; $(p^2 + 1)x + (p - 2)y = 5$
3. If $3x - 2y = 4$; $2x + y = 5$, then find the value of m such that $y = mx + 3$.
4. The difference between two numbers is 642. When the greater is divided by the smaller, the quotient is 8 and the remainder is 19. Find the number.
5. Solve $\frac{x}{6} - \frac{y}{15} = 4$ by cross multiplication method.

SECTION C

1. A fraction becomes $\frac{6}{5}$, if 1 is added to each of the numerator and denominator. However, if we subtract 5 each, the fraction becomes $\frac{3}{2}$. Find the fraction.
2. If 6 times the larger of the two numbers is divided by the smaller one, we get 8 as quotient and 6 as remainder. Also, if nine times the smaller number is divided by the larger one, we get 6 as quotient and 9 as remainder. Find the number.
3. A man takes 2 hours more than Nishant to cover a distance of 30 km. If the man doubles his speed, he would take 1 hour less then Nishant. Find their speed of walking.

4. The angles of a cyclic quadrilateral ABCD are $\angle A = (6x + 10)°, \angle B = 5x°, \angle C = (x + y)°$ and $\angle D = (3y - 10)°$.

5. Solve the pair of linear equation by elimination method $\frac{5}{x+y} - \frac{2}{x-y} = -1, \frac{15}{x+y} + \frac{7}{x-y} = 10$

SECTION D

1. Solve $ax + by = a - b$, $bx - ay = a + b$.

2. Solve $\frac{2xy}{x+y} = \frac{3}{2}$, $x + y \neq 0$

$\frac{xy}{2x-y} = \frac{-3}{10}$, $2x - y \neq 0$

3. A two digit number is obtained by either multiplying the sum of the digits by 8 and then subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number.

4. The area of a rectangle gets reduced by 8 m², when its length is reduced by 5 m and its breadth is increased by 3 m. If we increase the length by 3 m and breadth by 2 m, then the area is increased by 74 m². Find the length and breadth.

5. Two pipes can fill a swimming pool in 12 hrs. If the pipe of a larger diameter is used for 4 hours and the pipe of the smaller diameter for 9 hours, only half the pool can be filled. How long would it take for each pipe to fill the pool separately?

****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 7

CLASS: X **MATHEMATICS**

TRIGONOMETRIC IDENTITIES

SECTION A

1. Evaluate: $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta)$
2. If $x = a\cos\theta$ and $y = b\sin\theta$, then find the value of $b^2x^2 + a^2y^2$.
3. If $x = \cot A + \cos A$ and $y = \cot A - \cos A$, then find the value of $\left(\frac{x-y}{x+y}\right)^2 + \left(\frac{x-y}{2}\right)^2$
4. If $\sec^2\theta(1 + \sin\theta)(1 - \sin\theta) = k$, then find the value of k.
5. If $\sin A + \sin 2A = 1$, then show that $\cos 2A + \cos 4A = 1$

SECTION B

1. Prove that $(\operatorname{cosec} A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$
2. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, then show that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$.
3. Prove that $\frac{1-\sin\theta}{1+\sin\theta} = (\sec\theta - \tan\theta)^2$.
4. If $\sin\theta + \cot\theta = \sqrt{3}$, then prove that $\tan\theta + \cot\theta = 1$.

SECTION C

1. Prove that $\frac{\cos A}{1-\tan A} + \frac{\sin^2 A}{\sin A - \cos A} = \sin A + \cos A$
2. Prove that $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta} + \frac{\sin\theta + \cos\theta}{\sin\theta - \cos\varsigma} = \frac{2}{2\sin^2\theta - 1}$
3. Prove that $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$
4. Prove that $\sec^6\theta = \tan^6\theta + 3\tan^2\theta\sec^2\theta + 1$
5. Prove that $\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \frac{1+\sin\theta}{\cos\theta}$
6. Prove that $2(\sin^6\theta + \cos^6\theta) - 3(\sin^4\theta + \cos^4\theta) + 1 = 0$

SECTION D

1. Prove that $\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\cos ecA - 1}{\cos ecA + 1}$

2. Prove that $\frac{\tan\theta}{1 - \cot\theta} + \frac{\cot\theta}{1 - \tan\theta} = 1 + \sec\theta.\text{cosec}\theta$

3. If $\tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$, then prove that $4\sqrt{mn}$

4. If $\tan A = n\tan B$ and $\sin A = m\sin B$, the prove that $\cos^2 A = \frac{m^2 - 1}{n^2 - 1}$

5. Prove that $\frac{1}{\cos ecA - \cot A} - \frac{1}{\sin A} = \frac{1}{\sin A} - \frac{1}{\cos ecA + \cot A}$

6. If $\sec\theta + \tan\theta = p$, then show that $\frac{p^2 - 1}{p^2 + 1} = \sin\theta$

****

APEX PON VIDYASHRAM, VELACHERY (2017 – 18)

HALF-YEARLY – WORKSHEET 8

CLASS: X **MATHEMATICS**

ARITHMETIC PROGRESSION

SECTION A

1. Which term of an A.P 5, 9, 13, 17, ... is 81?
2. Find the middle term of the AP 213, 205, 197, ..., 37.
3. How many multiples of 4 lie between 10 and 250?
4. If the common difference of an A.P. is 5, then find the value of $a_{18} - a_{13}$.
5. Find the middle term of an A.P 1, 8, 15, 22, ... , 505.

SECTION B

1. For what value of p, $2p + 1$, 13 and $5p - 3$ are three consecutive terms of an A.P?
2. Find the 31^{st} term of an A.P, whose 11^{th} term is 38 and 16^{th} term is 73.
3. Find the 15^{th} term from the end of -10, -20, -30, ..., -1000.
4. Given for an A.P., last term = 30, $S_n = 146$ and $n = 9$, then what is the value of a?
5. Find the sum of the series of -5 + (-8) + (-11) + ... +(-230).

SECTION C

1. How many terms of the AP 54, 51, 48, ... should be taken so that their sum is 513? Explain the double answer.
2. The 14^{th} term of an AP is twice its 8^{th} term. If its 6^{th} term is -8 then find the sum of its first 20 terms.
3. In a flower bed, there are 23 rose plants in the first row, 21 in the second row, 12 in the third row and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?
4. The sum of the 4^{th} term and 8^{th} terms of an AP is 24 and the sum of its 6^{th} and 10^{th} term is 44. Find the find the first three terms of the AP.
5. If m times the m^{th} term of an AP is equal to n times the n^{th} term and $m \neq n$, show that its $(m + n)^{th}$ term is zero.

SECTION D

1. A sum if Rs 1000 is invested at 8% per annum simple interest. Calculate the interest at the end of 1, 2, 3, ... years. Is the sequence of interest an AP? Find the interest at the end of 30 years.
2. In a given AP if p^{th} term is q and q^{th} term is p then solve that the n^{th} term is $(p + q - n)$.
3. For what values of n are the n^{th} terms of the following two APs the same 13, 19, 25, ... and 69, 68, 67, ...? Also find this term.
4. Solve $1 + 4 + 7 + 10 + ... + x = 590$.
5. The ratio of the 11^{th} term to the 18^{th} terms of an AP is 2 : 3. Find the ratio of the 5^{th} term to the 21^{st} term, and also the ratio of the sum of the first five terms to the sum of the first 21 terms.

****