AL KHOZAMA INTERNATIONAL SCHOOL,DAMMAM

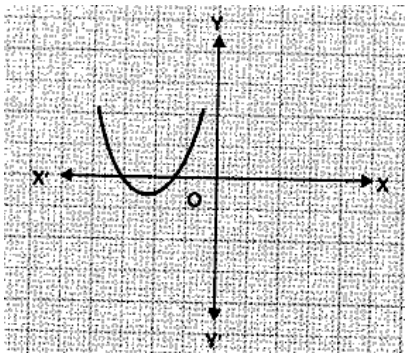
Affiliated to CBSE – New Delhi, No:5730019

CLASS 10 - MATHEMATICS

WORKSHEET-TERM-1

Section A

1. If product of two numbers is 3691 and their LCM is 3691, find their HCF. **[1]**
2. Without actually performing the long division, whether $\frac{29}{343}$ will have terminating decimal expansion or non-terminating repeating decimal expansion. **[1]**
3. Find the zeroes of the polynomial $(x - 2)^2 + 4$. **[1]**
4. The graph of y = p(x) are given in Fig. below, for some polynomial p(x). Find the number of zeroes of p(x). **[1]**



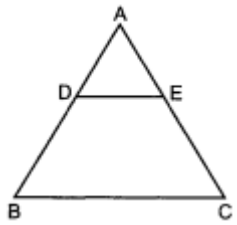
5. Sum and product of zeroes of a quadratic polynomial are 0 and $\sqrt{15}$ respectively. Find the quadratic polynomial. **[1]**
6. Find whether the following pair of equations has no solution, unique solution or infinitely many solutions. **[1]**

   $5x - 8y + 1 = 0$;

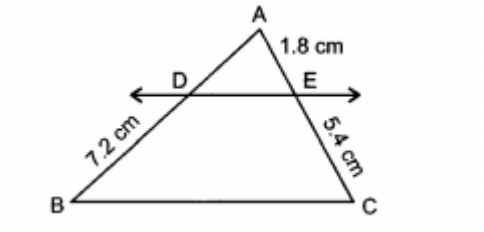
   $3x - \frac{24}{5}y + \frac{3}{5} = 0$
7. For what value of k the following pair of linear equation has unique solution? **[1]**

   $kx + 3y = 3$

   $12x + ky = 6$
8. In Figure, DE || BC. If DE = 4 cm, BC = 8 cm and area of △ADE = 25 cm^2, find the area of △ABC. **[1]**



9. In the given figure, DE || BC. **[1]**



Find AD.

10. Prove that $4 + \sqrt{2}$ is irrational. **[2]**

11. Find the largest positive integer that will divide 122,150 and 115 leaving remainders 5, 7, 11 respectively. **[2]**

12. During a class quiz on polynomials a teacher wrote the following polynomials on the blackboard and asked his students to find the degree of these polynomials. You have to write the degree of the these polynomials which the teacher asked for. **[2]**

    i. $7x^5 + 6y^2 - 1$

    ii. $\frac{y^4+3y^2+y}{y}$

    iii. $3x^2 + 7x + 2$

    iv. $\frac{t^8-3t^7+2t^5-6t^2}{t^2}$

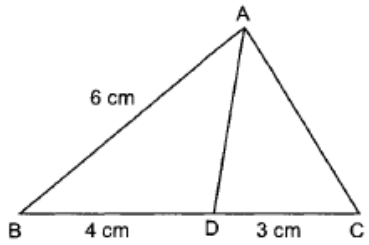
    v. $-10x^2 + 10x$

13. Using division algorithm, find the quotient and remainder on dividing f(x) and g(x) where,f(x) = $6x^3 + 13x^2 + x - 2$ and g(x) = 2x + 1. **[2]**

14. Solve the following pair of linear equations by the substitution method: $x + y = 14$, $x - y = 4$ **[2]**

15. Two straight paths are represented by the equations $x - 3y = 2$ and $-2x + 6y = 5$. Check whether the paths cross each other or not. **[2]**

16. In Fig. AD is the bisector of $\angle A$. If BD = 4 cm, DC = 3 cm and AB = 6 cm, determine AC. **[2]**



17. In an isosceles triangle ABC, with AB = AC, BD is perpendicular from B to the side AC. Prove that $BD^2 - CD^2 = 2CD.AD$ **[2]**

18. Find the value of m if the points (5, 1), (-2, -3) and (8, 2m) are collinear. **[2]**

19. If the mid-point of the line joining (3,4) and (k, 7) is (x, y) and 2x + 2y + 1 = 0 find the value of k. **[2]**

20. Two different dice are tossed together. Find the probability that **[2]**

    i. the number on each die is even,

    ii. the sum of the numbers appearing on the two dice is 5.

21. 12 defective pens are accidentally mixed with 132 good ones. It is not possible to just look at pen and tell whether it is defective or not. One pen is taken out at random from this lot. Find the probability that the pen taken out is good one. **[2]**

22. A card is drawn at random from a well-shuffled deck of 52 playing cards. Find the probability that the card drawn is **[2]**

i. a card of spades or an ace,

ii. a black king,

iii. neither a jack nor a king,

iv. either a king or a queen.

23. If d is the HCF of 30 and 72, find the values of x and y satisfying d = 30x + 72y **[3]**

24. Using Euclid's division algorithm, find whether the pair of numbers 847, 2160 are co primes. **[3]**

25. One zero of the polynomial x^2- 2x - (7p + 3) is -1, find the value of p and the other zero. **[3]**

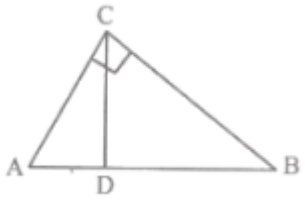
26. Find all zeroes of the polynomial f(x) = x^3+ 13x^2 + 32x + 20. If one of its zeroes is - 2. **[3]**

27. Solve for x and y using elimination method: 10x + 3y = 75, 6x - 5y = 11. **[3]**

28. Solve for x and y: $\frac{1}{7x} + \frac{1}{6y} = 3, \frac{1}{2x} - \frac{1}{3y} = 5$ (x $\neq$ 0, y $\neq$ 0) **[3]**

29. Solve the pair of linear equation: $\frac{x}{a} - \frac{y}{b} = 0$, ax + by = a^2 + b^2. **[3]**

30. In the given figure, $\angle$ACB = 90^o and CD $\perp$ AB, Prove that CD^2 = BD $\times$ AD. **[3]**



31. P and Q are points on the sides AB and AC respectively of a $\triangle ABC$. If AP = 2 cm, PB = 4 cm, AQ = 3 cm and QC = 6 cm, show that BC = 3PQ. **[3]**

32. Find the lengths of the medians of a $\triangle$ ABC whose vertices are A (7, -3), B (5,3) and C (3, -1). **[3]**

33. If the coordinates of the mid-points of the sides of a triangle are (1, 1), (2, -3) and (3, 4). Find its centroid. **[3]**

34. 17 cards numbered 1, 2, 3, 4, ..., 17 are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the card drawn bears **[3]**

i. An odd number

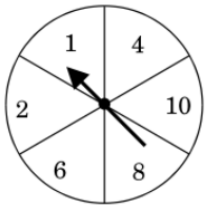
ii. A number divisible by 5.

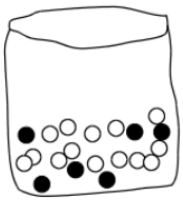
35. Read the following passage and answer the questions given at the end: **[3]**

Diwali Fair

A game in a booth at a Diwali Fair involves using a spinner first. Then, if the spinner stops on an even number, the player is allowed to pick a marble from a bag. The spinner and the marbles in the bag are represented in Figure.

Prizes are given when a black marble is picked. Shweta plays the game once.





i. What is the probability that she will be allowed to pick a marble from the bag?

ii. Suppose she is allowed to pick a marble from the bag, what is the probability of getting a prize, when it is given that the bag contains 20 marbles out of which 6 are black?

36. A group consists of 12 persons, of which 3 are extremely patient, other 6 are extremely honest and rest are extremely kind. A person from the group is selected at random. Assuming that each person is equally likely to be selected, find the probability of selecting a person who is **[3]**

i. extremely patient,

ii. extremely kind or honest.

which of the above values you prefer more?

37. The king, queen and jack of club are removed from a deck of 52 cards. Then the cards are well-shuffled. One card is drawn at random from the remaining cards. Find the probability of getting **[3]**

i. a heart

ii. a king

iii. a club

iv. a '10 'of hearts.

38. If α and β are the zeroes of polynomial p(x) = $3x^2$ + 2x + 1, find the polynomial whose zeroes are $\frac{1-\alpha}{1+\alpha}$ and $\frac{1-\beta}{1+\beta}$. **[5]**

39. Given that x - $\sqrt{5}$ is a factor of the polynomial x^3 - $3\sqrt{5}x^2$ - 5x + $15\sqrt{5}$, find all the zeroes of the polynomial. **[5]**

40. In a ΔABC, $\angle$C = 3 $\angle$B = 2 ($\angle$ A + $\angle$B). Find the three angles. **[5]**

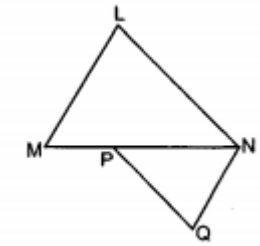
41. Use a single graph paper and draw the graph of the following equations: **[5]**

2y - x = 8; 5y - x = 14, y - 2x = 1

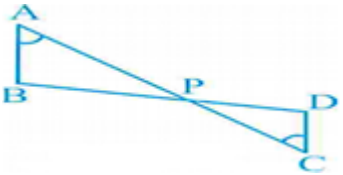
Obtain the vertices of the triangle so obtained.

42. The sum of the numerator and denominator of a fraction is 8. If 3 is added to both the numerator and denominator the fraction becomes $\frac{3}{4}$. Find the fraction. **[5]**

43. In figure, LM || NQ and LN || PQ. If MP = $\frac{1}{3}$MN. find the ratio of the areas of $\triangle$LMN and $\triangle$QNP. **[5]**



44. In the given figure, if $\angle$A = $\angle$C, AB = 6cm, BP = 15 cm, AP = 12cm and CP = 4, then find the lengths of PD and CD. **[5]**



45. Find the centre of a circle passing through the points (6, -6), (3, -7) and (3, 3). **[5]**

46. If 'a' is the length of one of the sides of an equilateral triangle ABC, base BC lies on x-axis and vertex B is at the origin, find the coordinates of the vertices of the triangle ABC. **[5]**

47. Three consecutive vertices of a parallelogram are (-2, -1), (1, 0) and (4, 3). Find the fourth vertex. **[5]**

Section B

48. **Read the case study based questions carefully and answer any four out of the following:** **[4]**

As we know reading is a good habit and library give equal opportunity to all people by making books available to all. Reading books in a library has some cost, the same way Library ABC has some policies of taking and reading books that is a fixed charge for the first three days and an additional charge for each day thereafter.

Following the same rules two students paid the library the following amount:

Shristi paid 27 for a book kept for seven days. While Bubbly paid 21 for the book kept for five days.

i. According to the given condition, if fix charge for the reading book is ₹ x and the additional charge for each day be ₹ y. then the linear equation is,
   a. x + 4y = 27; x+ 2y = 21
   b. x + 2y = 27; x + 4y = 21
   c. 4x + y = 27; 2x + y = 21
   d. 2x + y = 27; 4x + y = 21

ii. Graphically, the above pair of equations represents two lines which are
   a. Intersecting at exactly one point
   b. Intersecting at two points
   c. Coincident
   d. Parallel

iii. The value of fixed charge i.e.x and additional charge i.e y is:
   a. x = 3,Y = 15
   b. x = 15 ,Y = 3
   c. x = 6, Y = 12
   d. x = 12, Y = 6

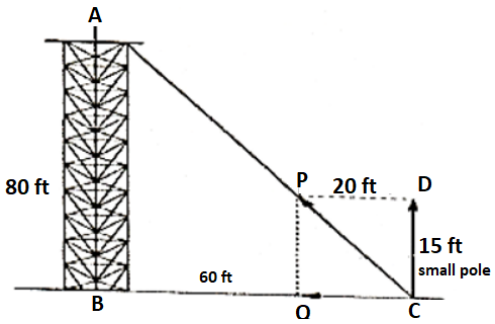
iv. Find how much additional charge Shristi ahd Bubbly paid.
   a. Bubbly paid additional ₹ 6 and Shristi paid ₹ 15.
   b. Bubbly paid additional ₹ 12 and Shristi paid ₹ 6.
   c. Bubbly paid additional ₹ 6 and Shristi paid ₹ 12.
   d. Bubbly paid additional ₹ 3 and Shristi paid ₹ 14.

v. A pair of linear equations $a_1x + b_1y + c_1 = 0$; $a_2x + b_2y + c_2 = 0$ is said to be inconsistent, if
   a. $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
   b. $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

c. $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

d. $\frac{a_1}{a_2} \neq \frac{c_1}{c_2}$

49. **[4]**



There exist a tower near the house of Shankar. The top of the tower AB is tied with steel wire and on the ground, it is tied with string support.

One day Shankar tried to measure the longest of the wire AC using Pythagoras theorem.

i. In the figure, the length of wire AC is: (take BC = 60 ft)

a. 75 ft

b. 100 ft

c. 120 ft

d. 90 ft

ii. What is the area of △ABC?

a. 2400 ft^2

b. 4800 ft^2

c. 6000 ft^2

d. 3000 ft^2

iii. What is the length of the wire PC?

a. 20 ft

b. 30 ft

c. 25 ft

d. 40 ft

iv. What is the length of the hypotenuse in △ABC?

a. 100 ft

b. 80 ft

c. 60 ft

d. 120 ft

v. What is the area of a △POC?

a. 100 ft^2

b. 150 ft^2

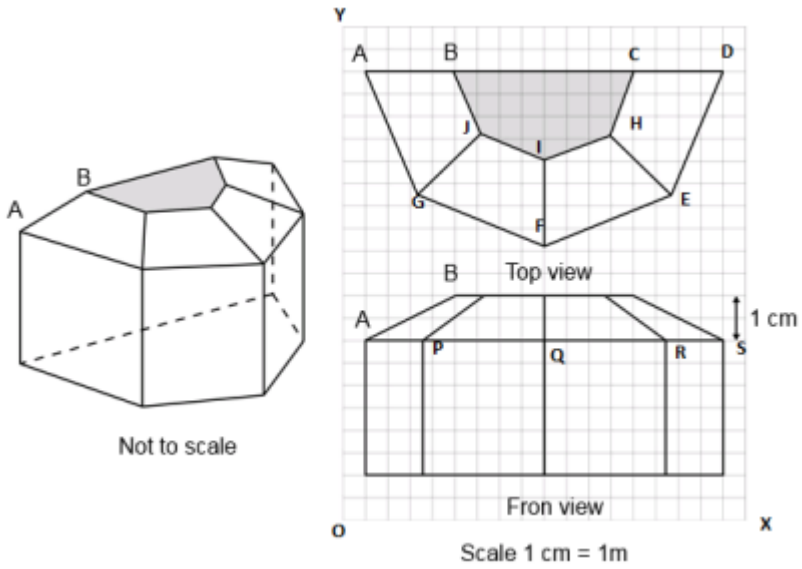
c. 200 ft^2

d. 250 ft^2

50. **SUN ROOM** **[4]**

The diagrams show the plans for a sun room. It will be built onto the wall of a house. The four walls of the sunroom are square clear glass panels. The roof is made using

- Four clear glass panels, trapezium in shape, all the same size
- One tinted glass panel, half a regular octagon in shape



i. Find the mid-point of the segment joining the points J (6, 17) and I (9, 16).[Refer to Top View]

a. $(\frac{33}{2}, \frac{15}{2})$
b. $(\frac{3}{2}, \frac{1}{2})$
c. $(\frac{15}{2}, \frac{33}{2})$
d. $(\frac{1}{2}, \frac{3}{2})$

ii. The distance of the point P from the y-axis is; [Refer to Top View]

a. 4
b. 15
c. 19
d. 25

iii. The distance between the points A and S is: [Refer to Front View]

a. 4
b. 8
c. 16
d. 20

iv. Find the coordinates of the point which divides the line segment joining the points A and B in the ratio 1:3 internally. [Refer to Front View]

a. (8.5, 2.0)
b. (2.0, 9.5)
c. (3.0, 7.5)
d. (2.0, 8.5)

v. If a point (x,y) is equidistant from the Q(9,8) and S(17,8), then [Refer to Front View]

a. x + y = 13
b. x - 13 = 0
c. y - 13 = 0
d. x - y = 13