S.D.PUBLIC SCHOOL,BU- BLOCK, PITAMPURA, DELHI
HOLIDAYS' HOMEWORK 2025 - 26
SUBJECT- MATHEMATICS
CLASS – X

Instructions: 1) The assignment has to be done on A4 sheets.
2) Submit the assignment in a stick file.

Assignment

Real Numbers

1. Two natural numbers whose difference is 66 and the least common multiple is 360, are
(a) 120 and 54 (b) 90 and 24
(c) 180 and 114 (d) 130 and 64

2. LCM of smallest prime and smallest odd composite natural number is
(a) 6 (b) 12
(c) 18 (d) 24

3. If p and q are tow co-prime numbers, then the HCF and LCM of p and q is
(a) HCF= p, LCM= pq (b) HCF= 1, LCM= pq
(c) HCF= q, LCM= pq (d) HCF= pq, LCM= pq

4. LCM of two numbers is 10 times their HCF. Sum of HCF and LCM is 495. If one number is 90, then find the other number.

5. Find the sum of exponents of 2 and 3 in prime factorization of 3600

6. Check whether 6^n can end with the digit 0 for any natural number n.

7. Prove that $2 + 5\sqrt{3}$ is an irrational number.

8. Prove that $\frac{1}{2} - \frac{\sqrt{7}}{5}$ is irrational

9. Find the LCM and HCF of 510 and 92 and verify that LCM × HCF = product of the two numbers

10. Find the largest number that divides 2053 and 967 and leaves a remainder of 5 and 7 respectively.

11. Prove that $\sqrt{5}$ is an irrational number

12. A garden has 48 guava trees, 60 pineapple trees and 96 mango trees. These have to be arranged in rows such that each row has same number of trees and all are of same type. Find the minimum numbers of such rows that can be formed?

13. On MG road, three consecutive traffic lights change after 36, 42 and 72 seconds. If the lights are first switched at 9:00 am, at what time will they change simultaneously again?

14. A seminar is being conducted by an educational organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 36, 84 and 108 respectively.

Based on the above information, answer the following questions:

(i) In each room the same number of participants are to be seated and all of them being in the same subject, Find the maximum number of participants that can be accommodated in each room.

(ii) What is the minimum number of rooms required during the event?

(iii) Find the number of participants in English room.

15. ASSERTION REASON BASED QUESTION:

In the following question, a statement of Assertion(A) is followed by a statement of Reason (R).

Choose the correct answer out of the following choices
(a) Both (A) and (R) are true and (R) is the correct explanation of (A).
(b) Both A and (R) are true and (R) is not the correct explanation of (A).
(c) (A) is true but (R) is false.
(d) (A) is false but (R) is true.
Assertion(A): If LCM of two numbers is 2475 and their product is 12375, then their HCF is 5
Reason(R): HCF (a,b) × LCM (a,b) = a × b

Polynomials

1. The graph of a polynomial $P(x)$ cuts the x-axis at 3 points and touches it at 2 other points, then the number of zeroes of $P(x)$ is

(a) 1 (b) 2 (c) 3 (d) 5

2. The number of polynomials having zeroes 2 and -3 is

(a) 1 (b) 2 (c) 3 (d) more than 3

3. The shape of the graph of a quadratic polynomial is

(a) Spiral (b) elliptical (c) parabolic (d) linear

4. The number of real zeroes that polynomial $f(x) = (x-2)^2 + 4$ can have is

(a) 1 (b) 0 (c) 2 (d) 3

5. If α and β are the zeroes of quadratic polynomial $x^2 - 6x + k$ and $3\alpha + 2\beta = 20$, then find the value of k.

6. If α and β are the zeros of the polynomial $2x^2 + 3x + 4$ find the value of

(i) $1/\alpha^2 + 1/\beta^2$ (ii) $\alpha + \beta + \alpha\beta$ (iii) $\alpha^2\beta + \beta^2\alpha$

7. If α and β are the zeros of the polynomial $x^2 - 3x + 7$, find a quadratic polynomial whose zeros are (i) $1/\alpha$ and $1/\beta$ (ii) $-\alpha$ and $-\beta$ (iii) $2\alpha + 1$ and $2\beta + 1$

8. Find the zeros and verify the relation between zeros and coefficients of

(i) $x^2 + 11x + 30$ (ii) $x^2 - 9$ (iii) $\sqrt{3}x^2 + 10x + 7\sqrt{3}$

9. Find a quadratic polynomial whose sum and product of zeros are 1/3 and -1/3

10. If the sum of the zeroes of the quadratic polynomial $ky^2 + 2y - 3k$ is equal to twice their product, find the value of k.

11. If α and β are the zeroes of quadratic polynomial $2x^2 + 5x + k$, find the value of k such that $(\alpha + \beta)^2 - \alpha\beta = 24$.

12. If one zero of the polynomial $(k+1)x^2 - 5x + 5$ is the multiplicative inverse of the other, then find the zeroes of $kx^2 - 3kx + 9$, where k is a constant.

13. If one zero of the quadratic polynomial $4x^2 - 8kx + 8x - 9$ is negative of the other, then find the zeroes of $kx^2 + 3kx + 2$.

14. If 2 and 3 are zeroes of the polynomial $3x^2 - 2kx + 2m$, find the values of k and m.

15. Given $m + 2$ is a zero of the polynomial $q(x) = x^2 - mx - 6$, find the value of m.

Pair of linear equations in two variables

1. Find c if the system of equations $cx + 3y + (3 - c) = 0$ and $12x + cy - c = 0$ has infinitely many solutions.
2. Solve the following pair of equations:
   $3^{x+y} = 243$
   $243^{x-y} = 3$
3. Check whether the following pair of linear equations is consistent or not:
   $$x + 2y - 8 = 0, 2x + 4y = 16$$
4. Find k if $kx + 3y + 1 = 0$ and $2x + y + 3 = 0$ has unique solution.
5. Solve for x and y: $254x + 309y = -55$, $309x + 254y = 55$
6. Check whether 5x – 3y = 11 and -10x + 6y = -22 represent intersecting lines, parallel lines or coincident lines.
7. Draw the graph of the following: $3x + y + 1 = 0$ and 2x – 3y + 8 =0 Also shade and find the area bounded by these lines and $y = 0$. Also, find the coordinates of the shaded region.
8. For what values of a and b the following system of equations have infinite many solutions: $3x - (a + 1)y = 2b - 1$ and $5x + (1 - 2a)y = 3b$
9. A two-digit number can be obtained either multiplying the sum of the digits by 8 or multiplying the difference of the digits by 14 and adding 2. Find the number.
10. A small-scale industry produces certain number of items per day. The cost of production of each item was calculated to be 74 minus twice the number of articles produced in a day. On a particular day the total cost of production was Rs. 540. Find the number of articles produced.
11. Raman has two daughters Deepa and Anju. Present age of Raman is nine more than that of twice the sum of Deepa and Anju. Five years hence, the age of Raman will be 4 more than one and half times the sum of the ages of Deepa and Anju. Determine the age of Raman
12. Solve: $\frac{bx}{a} - \frac{ay}{b} + a + b = 0$ and $bx - ay + 2ab = 0$
13. Two linear equations in variables x and y are given below:
    $a_1x + b_1y + c = 0$
    $a_2x + b_2y + c = 0$
    Which of the following pieces of information is independently sufficient to determine if a solution exists or not for this pair of linear equations?
    I. $\frac{a_1}{b_1} = \frac{a_2}{b_2} = 1$ II. $\frac{a_1}{a_2} = \frac{b_1}{b_2}$
    III. $\frac{a_1}{a_2} = \frac{a_1}{b_1} \neq 1$ IV. $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
    (a) IV (b) I and IV
    (c) II and IV (d) I and III
14. If three times the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also, if seven times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the numbers.
15. The area of a rectangle reduces by 160 m^2 if its length is increased by 5 m and breadth is reduced by 4 m. However, if the length is decreased by 10 m and breadth is increased by 2 m, then its area is decreased by 100 m^2. Find the dimensions of the rectangle.
16. A train covered a certain distance at a uniform distance. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time and if the train were slower by 10 km/h, it would have taken 3 hours more than the scheduled time. Find distance covered by the train.
17. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each incorrect answer, then Yash would have scored 50 marks. How many questions were there in the test?

18. Points A and B are 70 km apart on a highway. A car starts from A and another from B simultaneously. If they travel in the same direction, they meet in 7 hours, but if they travel towards each other, they meet in one hour. Find the speed of the two cars.

19. The sum of the numerator and denominator of a fraction is 3 less than twice the denominator. If the numerator and denominator are decreased by 1, the numerator becomes half the denominator. Determine the fraction.

20. A part of monthly hostel charges in a college hostel are fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 25 days, he has to pay ₹ 4500, whereas a student B who takes food for 30 days, has to pay ₹ 5200. Find the fixed charges per month and the cost of food per day.

Chapter –14 (Probability)

1. If P(A) denotes the probability of an event A, then
(a) $P(A) < 0$ (b) $P(A) > 1$ (c) $0 \leq P(A) \leq 1$ (d) $-1 \leq P(A) \leq 1$

2. A card is drawn from a well shuffled deck of 52 playing cards> the event E is that card is not an ace of hearts. The number of outcomes favourable to E is
(a) 51 (b) 48 (c) 13 (d) 4

3. Someone is asked to choose a number from 1 to 100. What is the probability of it being a prime number?

4. Find the probability of getting 53 Wednesdays in a (i) leap year (ii) non-leap year

5. A card is drawn at random from a well shuffled deck of 52 playing cards. Find the probability of getting
(i) neither a red card nor a queen. (ii) either a face card or black card
(iii) a black card and a jack (iv) red face card

6. Two dice are thrown at the same time and the product of numbers appearing on them is noted. Find the probability that the product is a prime number.

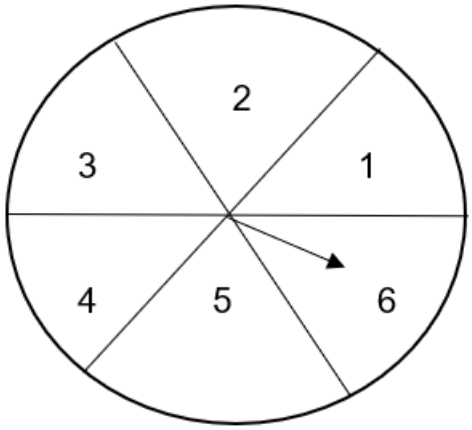
7. Three unbiased coins are tossed together. Find the probability of getting:
(i) All heads (ii) exactly two heads
(iii) Exactly one head (iv) at least two heads
(v) At least two tails (vi) at most two tails

8. In a single throw of a pair of different dice, what is the probability of getting
(i) A prime number on each dice?
(ii) A total of 9 or 11?
(iii) A doublet
(iv) A doublet of even numbers
(v) A sum less than 8
(vi) Sum greater than 6 but less than 9.

9. 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.

10. In figure, shown a disc on which a player spins an arrow twice. The fraction $\frac{a}{b}$ is formed, where a is the number of sector on which arrow stops on the first spin and b is the number of the sector in which the arrow stops on the second spin. On each spin, each sector has equal

chance of selection by the arrow. Find the probability that the fraction $\frac{a}{b} > 1$.



11. A die is thrown twice. What is the probability that
(i) 5 will not come up either time?
(ii) 5 will come up at least once?

12. Find the probability of getting 53 Fridays in a (i) leap year (ii) non leap year.

13. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball from the bag is thrice that of a red ball, find the number of blue balls in the bag.

14. Apoorv throws two dice once and computes the product of the numbers appearing on the dice. Peehu throws one die and squares the number that appears on it. Who has the better chance of getting the number 36? Why?

15. A carton of 24 bulbs contain 6 defective bulbs. One bulb is drawn at random. What is the probability that the bulb is not defective? If the bulb selected is defective and it is not replaced and a second bulb is selected at random from the rest, what is the probability that the second bulb is defective?

16. A child's game has 8 triangle of which 3 are blue and rest are red, and 10 squares of which 6 are blue and rest are red. One piece is lost at random. Find the probability that it is a
(i) Triangle
(ii) Square
(iii) Square of blue colour
(iv) Triangle of red colour

17. Box A contains 25 slips of which 19 are marked ₹ 1 and the other are marked ₹ 5 each. Box B contains 50 slips of which 45 are marked ₹ 1 each and others are marked ₹ 13 each. Slips of both the boxes are poured into a third box and reshuffled. A slip is drawn at random. What is the probability that it is marked other than ₹ 1?

18. A die has six faces marked 0, 1, 1, 1, 6, 6. Two such dice are thrown together and the total score is recorded. How many different scores are possible? What is the probability of getting a total of 7?

19. A number x is chosen at random from the numbers $-3, -2, -1, 0, 1, 2, 3$. What is the probability that $|x| < 2$?

20. A bag contains white, black and red balls only. A ball is drawn at random from the bag. The probability of getting a white ball is $\frac{3}{10}$ and that of a black ball is $\frac{2}{5}$. Find the probability of getting a red ball. If the red ball contains 20 black balls, then find the total number of balls in the bag.