ASSIGNMENT FOR SUMMER VACATION.

SUB:- MATHEMATICS CLASS:- X SESSION 2023-24

1. Complete Your Art Integrated Project

Note:- Complete all assignments in a separate copy.

2. Solve Monthly test – 1 (April)

3. Solve all the given sets

PRACTICE SET – 1

Real No. (Class:- X)

1. Find the HCF and LCM of the following numbers by using prime factorization method.

(a) 126 & 156 (b) 612 & 1314 (c) 108,120,252

(d)150,420 (e) 144,198 (f) 396, 1080

(g) 24, 36, 40 (h) 30, 72, 432

2. Find the HCF and LCM of the following numbers and verify that HCF × LCM = product of given numbers.

(i) 36, 84 (ii) 46, 51 (iii) 15, 60 (iv) 18, 63 (v) 78, 104

3. Find HCF and LCM of 404 and 96 and verify that HCF×LCM= Product of the two given numbers.

4. Show that any number of the form 4^n, n ∈ N can never end with the digit 0

5. Show that any number of the form 6^n, where n ∈ N can never end with digit 0.

6. Find the largest number which divides 248 and 1032 leaving remainder 8 in each case.

7. Find the largest number which divides 546 and 764, leaving remainder 6 and 8 respectively.

8. Two tankers contain 850**l** and 680**l** of petrol. Find the maximum capacity of a container which can measure the petrol of each tanker in exact number of times.

9. The length, breadth and height of a room are 8m 25 cm, 6m 75 cm and 4m and 50 cm respectively. Find the length of the longest rod that can measure the three dimensions of the room exactly.

10. Prove the given numbers are irrational:-

(a) $\sqrt{2}$ (b) $\sqrt{5}$ (c)$7\sqrt{5}$ (d) $\frac{1}{\sqrt{2}}$ (e) $3 + 2\sqrt{5}$ (f) $(\sqrt{2} + \sqrt{5})$

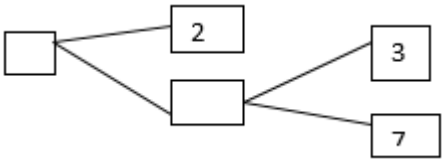
11. Explain why (7 x 11 x 13) + 13 and (7 x 6 x 5 x 4 x 3 x 2 x 1) + 5 are composite numbers.

12. Give an example of two irrational numbers:-

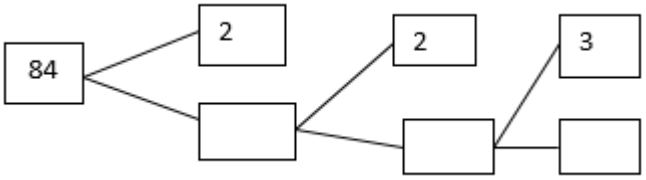
(a) Whose sum is rational (b) Whose product is rational?

13. Complete the missing entries in the following factor-tree.

(a)



(b)



PRACTICE SET – 2

1. Find the HCF × LCM for the numbers 100 and 190

2. If a = $2^3.3^5$ and b = $3^2.2^5$, then what is the HCF and LCM of a and b?

3. Write whether $\frac{2\sqrt{45}+3\sqrt{20}}{2\sqrt{5}}$ on simplification gives a rational or an irrational number.

4. Write the prime factors of 546.

5. The HCF of two numbers is 27 and their LCM is 162. If one of the number is 54, what is the other number?

6. What is the largest number that divides 70 and 125, leaving remainders 5 and 8 respectively?

7. Find the LCM of (2^3 x 3 x 5) and (2^4 x 5 x 7).

8. Find a rational and an irrational number between $\sqrt{2}$ and $\sqrt{3}$.

9. 13. What is the least number that is divisible by all the natural numbers from 1 to 10?

10. What is the largest number that divides 245 and 1029, leaving remainder 5 in each case?

11. a and b are two positive integers such that the least prime factor of a is 3 and the least prime factor of b is 5. Then calculate the least prime factor of (a + b)

12. The numbers 525 and 3000 are both divisible only by 3, 5, 15, 25 and 75. What is HCF (525, 3000)? Justify your answer

13. Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.

PRACTICE SET – 3

1. Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials:

(a) $4x^2 - 3x - 1$ (b) $3x^2 + 4x - 4$ (c) $x^2 + \frac{1}{6}x - 2$

(d) $5t^2 + 12t + 7$ (e) $2x^2 + \frac{7}{2}x + \frac{3}{4}$ (f) $4x^2 + 5\sqrt{2}x - 3$

(g) $2\sqrt{3}x^2 - 5x + \sqrt{3}$ (h) $8x^2 - 4$

2. For each of the following, find a quadratic polynomial whose sum and product respectively of the zeroes are as given. Also find the zeroes of these polynomials by factorisation.

(a) $-\frac{8}{3}, \frac{4}{3}$ (b) -4, - 12 (c) $\frac{21}{8}, \frac{5}{16}$ (d) $-2\sqrt{3}, -9$

3. Find the quadratic polynomial whose zeroes are

(a) 2 , - 6 (b) 1, - 3 (c) $\frac{2}{3}, -\frac{1}{4}$

4. If (x + a) is a factor of the polynomial $2x^2 + 2ax + 5x + 10$, find the value of 'a'.

5. Quadratic polynomial $2x^2 - 3x + 1$ has zeroes as $\alpha \; and \; \beta$. Now form a quadratic polynomial whose zeroes are $3\alpha \; and \; 3\beta$.

6. If $\alpha \; and \; \beta$ are the zeroes of the polynomial $6y^2 - 7y + 2$, find a quadratic polynomial whose zeroes are $\frac{1}{\alpha}$ and $\frac{1}{\beta}$.

7. If the sum of the zeroes of the polynomial $p(x) = (k^2 - 14)\, x^2 - 2x - 12$ is 1, then find the value of k.

8. If α and β are the zeroes of the polynomial $ax^2 + bx + c$, find the value of $\alpha^2 + \beta^2$.

9. If the sum of the zeroes of the polynomial $p(x) = (k^2 - 14)\, x^2 - 2x - 12$ is 1, then find the value of k.

10. Find the condition that zeroes of polynomial $p(x) = ax^2 + bx + c$ are reciprocal of each other.

11. Form a quadratic polynomial whose zeroes are 3 + √2 and 3 – √2.

12. If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of $2x^2 - 5x - 3$, find the value of p and q.

PRACTICE SET – 4

1. If α and β be two zeroes of the quadratic polynomial $p(x) = 2x^2 - 3x + 7$, evaluate :-

(a) $\frac{1}{\alpha} + \frac{1}{\beta}$ (b) $\alpha^2 + \beta^2$ (c) $\alpha^3 + \beta^3$

(d) $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$ (e) $\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right) + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta$

2.If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4, find the value of 'a'

3.If the sum of the zeroes of the polynomial $(a + 1)x^2 + (2a + 3)\, x + (3a + 4)$ be -1, find the product of its zero.

4.Find k, if the sum of the zeroes of the polynomial $x^2 - (k + 6)x + 2(2k - 1)$ is half their product.

5 . If the zeroes of the polynomials $x^3 - 3x^2 + x + 1$ are a –b, a, a + b, find a and b.

6.If α and β are the zeroes of the polynomial $6y^2 - 7y + 2$, find a quadratic polynomial whose zeroes are $\frac{1}{\alpha} \; and \; \frac{1}{\beta}$.

7. If $\alpha \; and \; \beta$ are the zeroes of the quadratic polynomial $f(x) = 2x^2 - 5x - 7$, find a polynomial whose zeroes are $2\alpha + 3\beta$ and $3\alpha + 2\beta$.

8. If one zero of the polynomial $3x^2 - 8x + 2k + 1$ is seven times the other, find the value of k.

9.If one zero of the polynomial $2x^2 + 3x + p$ is $\frac{1}{2}$, find the value of p and other zero.

10.If one zero of polynomial $(a^2 + 9)x^2 + 13x + 6a$ is reciprocal of the other, find the value of a.

11. If α and β are the zeroes of the polynomial $5x^2 - 7x - 2$, find the sum of the reciprocals.

PRACTICE SET – 5

1. Find what value of k, (-4) is a zero of the polynomial $x^2 - x - (2k + 2)$?

2. If 1 is a zero of the polynomial $p(x) = ax^2 - 3(a - 1)x - 1$, then find the value of a.

3. Write the zeroes of $x^2 + 2x + 1$.

4. Write a polynomial whose zeroes are – 5 and 4.

5. Write a polynomial whose zeroes are $2 + \sqrt{3}\ and\ 2 - \sqrt{3}$.

6. If $\alpha\ and\ \beta$ are the zeroes of $x^2 + 5x + 8$ then find the (a) $\alpha + \beta$ (b) $\alpha\beta$

7. If one zero of the quadratic polynomial $kx^2 + 3x + k$ is 2 then find the value of k.

8. If – 2 and 3 are the zeroes of the quadratic polynomial $x^2 + (a + 1)x + 6$ then find the value of a and b.

9. If one zero of $3x^2 + 8x + k$ be the reciprocal of the other then find the value of k.

10. If the sum of the zeroes of the quadratic polynomial $kx^2 + 2x + 3k$ is equal to the product of its zeroes then find the value of k.

11. If α, β are the zeroes of the polynomial $x^2 + 6x + 2$, then find $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$.

12. If α, β, γ are the zeroes of the polynomial $2x^3 + x^2 - 13x + 6$, then find (a) $\alpha\beta\gamma$ (b) $\alpha\beta + \beta\gamma + \alpha\gamma$.

13. If α, β be the zeroes of the polynomial $2x^2 + 5x + k$ such that $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then find k.

14. Can x – 2 be the remainder on division of a polynomial p(x) by (x + 3)?

15. What number should be added to the polynomial $x^2 - 5x + 4$, so that 3 is the zero of the polynomial?

PRACTICE SET – 6

1. On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}\ and\ \frac{c_1}{c_2}$, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident.

(a) x + 2y – 2 = 0 ; 2x + 4y – 4 = 0 (b) x – 2y = 0 ; 3x + 4y – 20 = 0

(c) 2x + 3y + 9 = 0 ; 4x + 6y – 18 = 0 (d) 5x – 4y + 8 = 0 ; 7x + 6y – 9 = 0

2. On comparing the ratios $\frac{a_1}{a_2}, \frac{b_1}{b_2}\ and\ \frac{c_1}{c_2}$, find out whether the following pairs of linear equations are consistent or inconsistent.

(a) 3x + 2y = 5 ; 2x – 3y = 7 (b) 2x – 3y = 8 ; 4x – 6y = 9

(c) x + 2y – 4 = 0 ; 2x + 4y – 12 = 0 (d) x – 2y = 0 ; 3x + 4y – 20 = 0

3. Solve the following system of linear equations graphically:-

(a) 2x + 3y = 2; x – 2y = 8 (b) 3x + 2y = 4 ; 2x – 3y = 7

(c) 3x + 2y = 12 ; 5x – 2y = 4 (d) 3x + y + 1 = 0 ; 2x – 3y + 8 = 0

4. Solve the following system of linear equations graphically:-

2x – 3y – 17 = 0; 4x + y – 13 = 0

Shade the regions between the lines and x –axis.

5. Draw the graphs of the equations x – y + 1 = 0 and 3x + 2y – 12 = 0. Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis , and shade the triangle region.

6. Solve by means of graph x – y = 1, 2x + y = 8 and shade the area bounded by these lines and y-axis. Also, find this area.

7. Check graphically whether the pair of linear equations: 4x – y – 8 = 0 and 2x – 3y + 6 = 0 is consistent. Also, determine the vertices of the triangle formed by the lines and the x-axis.

8. Find graphically the vertices of a triangle whose sides are y = x, y = 2x , x + y = 6 .

9. Given the linear equation 2x + 3y – 8 = 0, write another linear equation in two variables such that the geometrical representation of the pair so formed is :-

(i) Intersecting lines (ii) parallel lines (iii) coincident lines

10. Draw the graphs of the following equations on the same graph paper:-

2x + y = 2, 2x + y = 6

Find the coordinates of the vertices of the trapezium formed by these lines. Also, find the area of the trapezium so formed.

11. Show graphically that the system of linear equations

2x – 3y = 5, 6y – 4x = 3 is inconsistent, i.e has no solution.

PRACTICE SET – 7

1. Solve for x and y using substitution method:-

(a) 2x + 3y = 0 ; 3x + 4y = 5 (b) x + y = 14 ; x – y = 4

(c) $\frac{3x}{2} - \frac{5y}{3} = -2$; $\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$

2. Solve for x and y using elimination method:-

(a) 3x + 4y = 10 and x – y = 1

(b) 11x + 15y + 23 = 0, 7x – 2y – 20 = 0

(c) 0.4x – 1.5y = 6.5 and 0.3x + 0.2y = 0.9

(d) $\frac{4}{x} + 3y = 8 \; and \; \frac{6}{x} - 4y = -5$

3. Solve for x and y:

(a) 5x + 31y = 103; 31x + 4y = 77

(b) 31x + 43y = 117; 43x + 31y = 105

(c) 99x + 101y = 409; 101x + 99y = 501

(d) 254x + 309y = - 55; 309x + 254y = 55

4. (i) For which values of a and b does the following pair of linear equations have an infinite number of solutions?

$2x + 3y = 7$, $(a - b)x + (a + b)y = 3a + b - 2$

(ii) For which values of k will the following pair of linear equations have no solution?

$3x + y = 1$, $(2k - 1)x + (k - 1)y = 2k + 1$

5. Find the value of k for which the pair of linear equations

$kx + 3y = k - 2$ and $12x + ky = k$ has no solution.

6. For what value of 'k' will the following pair of linear equations have infinitely many solutions :

$kx + 3y = k - 3$; $12x + ky = k$

7. Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$.