

## MATHEMATICS

### PRACTICE QUESTIONS EXERCISE 281023

(Polynomials, Liner Equations, A.P.)

#### POLYNOMIALS

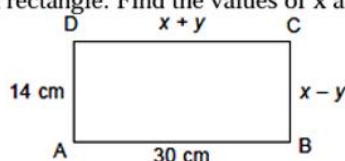
1. Find the zeroes of  $\sqrt{3}x^2 + 10x + 7\sqrt{3}$
2. Find a quadratic polynomial whose zeroes are  $-9$  and  $-\frac{1}{9}$ .
3. If the sum of the zeroes of the quadratic polynomial  $ky^2 + 2y - 3k$  is equal to twice their product, find the value of  $k$ .
4. If the product of the zeroes of the polynomial  $ax^2 - 6x - 6$  is 4, then find the value of  $a$ . Also find the sum of zeroes of the polynomial.
5. Find the zeroes of  $p(x) = 4x^2 + 24x + 36$  quadratic polynomials and verify the relationship between the zeroes and their coefficients.
6. If  $\alpha$  and  $\beta$  are zeroes of the quadratic polynomial  $4x^2 + 4x + 1$ , then form a quadratic polynomial whose zeroes are  $2\alpha$  and  $2\beta$ .
7. If  $\alpha, \beta$  are zeros of quadratic polynomial  $2x^2 + 5x + k$ , find the value of  $k$  such that  $(\alpha + \beta)^2 - \alpha\beta = 24$ .
8. If  $\alpha, \beta$  are zeroes of polynomial  $p(x) = 5x^2 + 5x + 1$  then find the value of  
 (i)  $\alpha^2 + \beta^2$  (ii)  $\alpha^{-1} + \beta^{-1}$  (iii)  $\alpha^3 + \beta^3$

#### A.P.

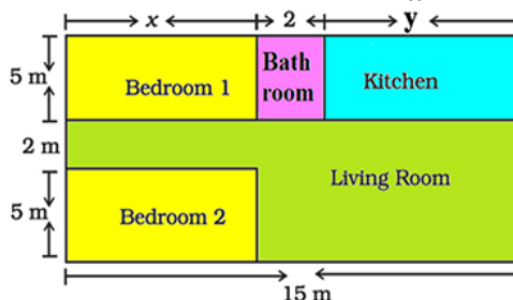
9. Determine  $k$  so that  $4k + 8, 2k^2 + 3k + 6$  and  $3k^2 + 4k + 4$  are three consecutive terms of an AP.
10. In an AP, the 24th term is twice the 10th term. Prove that the 36th term is twice the 16th term.
11. Find 10th term from end of the AP 4, 9, 14, ..., 254.
12. If the sum of first  $n$  terms of an AP is given by  $S_n = 3n^2 + 2n$ , find the  $n$ th term of the AP.
13. Find the value of the middle term of the following AP:  $-6, -2, 2, \dots, 58$ .
14. Which term of the progression  $19, 18\frac{1}{5}, 17\frac{2}{5}, \dots$  is the first negative term.
15. If the  $p$ th,  $q$ th,  $r$ th terms of an AP be  $x, y, z$  respectively, show that  $x(q - r) + y(r - p) + z(p - q) = 0$ .
16. If  $S_1, S_2, S_3$  are the sum of  $n$  terms of three APs, the first term of each being unity and the respective common difference being 1, 2, 3; prove that  $S_1 + S_3 = 2S_2$ .

### LINEAR EQUATIONS IN TWO VARIABLES

17. Solve for x and y:  $2x + 3y = 7$ ;  $4x + 3y = 11$
18. Find the values of a and b for which the following pair of linear equations has infinitely many solutions:  
 $2x + 3y = 7$ ;  $(a + b)x + (2a - b)y = 21$
19. Find the value(s) of k so that the pair of equations  $x + 2y = 5$  and  $3x + ky + 15 = 0$  has a unique solution
20. In the below Figure, ABCD is a rectangle. Find the values of x and y.



21. The sum of the digits of a two digit number is 9. The number obtained by reversing the order of digits of the given number exceeds the given number by 27. Find the given number.
22. Solve for x and y:  $\frac{x}{4} + \frac{2y}{3} = 7$ ;  $\frac{x}{6} + \frac{3y}{5} = 11$
23. Solve for x and y:  $\frac{x}{a} - \frac{y}{b} = 0$ ;  $ax + by = a^2 + b^2$
24. Solve the following system of equations graphically for x and y:  $3x + 2y = 12$ ;  $5x - 2y = 4$ . Find the co-ordinates of the points where the lines meet the y-axis.
25. Amit is planning to buy a house and the layout is given below. The design and the measurement has been made such that areas of two bedrooms and kitchen together is 95 sq.m.



Based on the above information, answer the following questions:

- Form the pair of linear equations in two variables from this situation.
- Find the length of the outer boundary of the layout.
- Find the area of each bedroom and kitchen in the layout.
- Find the area of living room in the layout.

#### ANSWERS:

- |   |                                      |
|---|--------------------------------------|
| 1. $x = -7/\sqrt{3}$ or $x = -\sqrt{3}$ | 15. -                                |
| 2. Sum = $-82/9$ , Product = 1          | 16. -                                |
| 3. $K = 1/3$                            | 17. $X = 2, Y = 1$                   |
| 4. $A = -3/2$ ; sum of zeros = -4       | 18. $A = 5, B = 1$                   |
| 5. Zeros = -3, -3                       | 19. All values other than 6          |
| 6. $x^2 + 2x + 1$                       | 20. $X = 22, y = 8$                  |
| 7. $K = -71/2$                          | 21. 36                               |
| 8. (i) $3/5$ ; (ii) -5; (iii) $-2/5$    | 22. $X = -564/7; y = 285/7$          |
| 9. $K = 0, 2$                           | 23. $X = a, y = b$                   |
| 10. -                                   | 24. (0,6), (0, -2)                   |
| 11. 209                                 | 25. (a) $x + y = 13$                 |
| 12. $6n-1$                              | (b) 54 m                             |
| 13. 26                                  | (c) $30 \text{ m}^2, 35 \text{ m}^2$ |
| 14. 25                                  | (d) $75 \text{ m}^2$                 |