

Worksheet of chapter 1, 2, 3 and 4

1. Can the number $6n$, n being a natural number, end with the digit 5? Give reasons.
2. Find the HCF of 441, 567, 693.
3. Find the largest number that divides 1251, 9377 and 15628 leaving remainders 1, 2 and 3, respectively.
4. . Prove that $3\sqrt{5} + 1$ is irrational
5. Show that $12n$ cannot end with the digit 0 or 5 for any natural number n
6. On a morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?
7. 1. If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1$ is -3 , then the value of k is
(A) $\frac{4}{3}$ (B) $-\frac{4}{3}$ (C) $\frac{2}{3}$ (D) $-\frac{2}{3}$
- 8 . A quadratic polynomial, whose zeroes are -3 and 4 , is
(A) $x^2 - x + 12$ (B) $x^2 + x + 12$ (C) $x^2 - 6x - 12$ (D) $2x^2 + 2x - 24$
9. If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3 , then
(A) $a = -7$, $b = -1$ (B) $a = 5$, $b = -1$ (C) $a = 2$, $b = -6$ (D) $a = 0$, $b = -6$
10. The number of polynomials having zeroes as -2 and 5 is
(A) 1 (B) 2 (C) 3 (D) more than 3
11. The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are
(A) both positive (B) both negative (C) one positive and one negative (D) both equal
12. The zeroes of the quadratic polynomial $x^2 + kx + k$, $k \neq 0$,
(A) cannot both be positive (B) cannot both be negative (C) are always unequal (D) are always equal
13. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, $c \neq 0$ are equal, then
(A) c and a have opposite signs (B) c and b have opposite signs (C) c and a have the same sign (D) c and b have the same sign
14. Find the zeroes of the polynomial $x^2 + \frac{1}{6}x - 2$, and verify the relation between the coefficients and the zeroes of the polynomial.
15. Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials
 1. $4x^2 - 3x - 1$
 2. $3x^2 + 4x - 4$
 3. $5t^2 + 12t + 7$
 4. $t^3 - 2t^2 - 15t$
 5. $2x^2 + 7x + 3$
 6. $4x^2 + 5x - 3$
16. 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
 - (i) $-\frac{8}{3}$, $\frac{4}{3}$ (ii) $\frac{21}{8}$, $\frac{5}{16}$ (iii) $-\frac{2}{3}$, -9 (iv) $-\frac{3}{2}\sqrt{5}$, 1
17. The pair of equations $5x - 15y = 8$ and $3x - 9y = \frac{24}{5}$ has

(A) one solution (B) two solutions (C) infinitely many solutions (D) no solution

17. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have

(A) a unique solution (B) exactly two solutions (C) infinitely many solutions (D) no solution

18. For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines?

(A) $1/2$ (B) $1/-2$ (C) 2 (D) -2

19. . One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be

(A) $10x + 14y + 4 = 0$ (B) $-10x - 14y + 4 = 0$ (C) $-10x + 14y + 4 = 0$ (D) $10x - 14y = -4$

20. Solve the following pair of linear equations: $21x + 47y = 110$ and

$$47x + 21y = 162$$

21. Draw the graphs of the pair of linear equations $x - y + 2 = 0$ and $4x - y - 4 = 0$. Calculate the area of the triangle formed by the lines so drawn and the x -axis.

22. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days, and an additional charge for each day thereafter. Latika paid Rs 22 for a book kept for six days, while Anand paid Rs 16 for the book kept for four days. Find the fixed charges and the charge for each extra day.

23. 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

24. Determine, algebraically, the vertices of the triangle formed by the lines $3x - y = 3$, $2x - 3y = 2$ and

$$x + 2y = 8$$

25. Ankita travels 14 km to her home partly by rickshaw and partly by bus. She takes half an hour if she travels 2 km by rickshaw, and the remaining distance by bus. On the other hand, if she travels 4 km by rickshaw and the remaining distance by bus, she takes 9 minutes longer. Find the speed of the rickshaw and of the bus.

26. Which one of the following is not a quadratic equation?

(A) $(x + 2)^2 = 2(x + 3)$ (B) $x^2 + 3x = (-1)(1 - 3x)^2$ (C) $(x + 2)(x - 1) = x^2 - 2x - 3$ (D) $x^3 - x^2 + 2x + 1 = (x + 1)^3$

27. Which of the following equations has 2 as a root?

(A) $x^2 - 4x + 5 = 0$ (B) $x^2 + 3x - 12 = 0$ (C) $2x^2 - 7x + 6 = 0$ (D) $3x^2 - 6x - 2 = 0$

28. If $1/2$ is a root of the equation $x^2 + kx - 5/4 = 0$, then the value of k is

(A) 2 (B) -2 (C) $1/4$ (D) $1/2$

29. Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is

(A) 0 only (B) 4 (C) 8 only (D) 0, 8

30. Which of the following equations has two distinct real roots?

(A) $2x^2 - 3\sqrt{2}x + 9/4 = 0$ (B) $x^2 + x - 5 = 0$ (C) $x^2 + 3x + 2\sqrt{2} = 0$ (D) $5x^2 - 3x + 1 = 0$

31. Find the roots of the quadratic equation $2x^2 - \sqrt{5}x - 2 = 0$ using the quadratic formula
32. Find the roots of the quadratic equations by using the quadratic formula in each of the following:
 (i) $2x^2 - 3x - 5 = 0$ (ii) $5x^2 + 13x + 8 = 0$ (iii) $-3x^2 + 5x + 12 = 0$
 (iv) $-x^2 + 7x - 10 = 0$ (v) $x^2 + 2\sqrt{2}x - 6 = 0$ (vi) $x^2 - 3\sqrt{5}x + 10 = 0$
33. Find the roots of the following quadratic equations by the factorisation method:
 (i) $2x^2 + 5/3x - 2 = 0$ (ii) $2/5x - x - 3/5 = 0$ (iii) $3\sqrt{2}x^2 - 5x - \sqrt{2} = 0$
 (iv) $3x^2 + 5\sqrt{5}x - 10 = 0$ (v) $21x^2 - 2x + 1/21 = 0$
34. Check whether the equation $6x^2 - 7x + 2 = 0$ has real roots, and if it has, find them by the method of completing the squares.
35. : A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed?
36. A train, travelling at a uniform speed for 360 km, would have taken 48 minutes less to travel the same distance if its speed were 5 km/h more. Find the original speed of the train
37. Find whether the following equations have real roots. If real roots exist, find them.
 (i) $8x^2 + 2x - 3 = 0$ (ii) $-2x^2 + 3x + 2 = 0$ (iii) $5x^2 - 2x - 10 = 0$
38. prove that $\sqrt{3}$ and $\sqrt{5}$ are irrational number.
39. A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid ` 27 for a book kept for seven days, while Susy paid ` 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.
40. The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is ` 105 and for a journey of 15 km, the charge paid is ` 155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km?
41. A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. We need to find the speed of the train
42. Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. We would like to find Rohan's present age.