

VIII H.W - 22nd February (Linear Equations in One Variable)

- 1) If $\frac{3x+5}{2x+1} = \frac{1}{3}$, then the value of x is
(a) -2 (b) -1 (c) -3 (d) 4
- 2) If $\frac{2}{5}x + 1 = \frac{7}{5}$, then x is equal to
(a) 0 (b) -1 (c) 1 (d) 2
- 3) The sum of two numbers which are in the ratio 2:5 is 21. The numbers are
(a) 8, 13 (b) 7, 14 (c) 6, 15 (d) 12, 9
- 4) If 8 is added to 4 times a number, the result is two less than 5 times the number. The number is
(a) 15 (b) 10 (c) 16 (d) 20
- 5) If seven less than 5 times the number is equal to 8 more than twice the number. The number is
(a) 6 (b) 5 (c) 8 (d) 4
- 6) If $\frac{x-3}{5} - 2 = -1$, then x is equal to
(a) -7 (b) 3 (c) 8 (d) 2
- 7) If $\frac{x-3}{x+3} = \frac{5}{6}$, then x is equal to
(a) 33 (b) 27 (c) 18 (d) 48
- 8) If 15 added to the square of a number is 6 less than the square of its successor. The number is
(a) 6 (b) 10 (c) 12 (d) 8
- 9) A number is such that it is as much greater than 27 as it is less than 35. The number is
(a) 31 (b) 4 (c) 62 (d) 30
- 10) After 14 years, I shall be three times as old as I was 4 years ago. My present age is
(a) 15 years (b) 16 years (c) 13 years (d) 10 years.
- 11) If $\frac{x}{2} + \frac{x}{3} - \frac{x}{4} = 14$, then the value of x is
(a) 14 (b) 25 (c) 26 (d) 24
- 12) If $\frac{x-8}{3} = \frac{x-3}{2}$, then x is equal to (a) 6 (b) -7 (c) 5 (d) -4

Fill in the blanks

- 1) The equation $5x+8=0$ is an example of _____ equation.
- 2) The value of the variable, for which an equation is true is called the _____ of the equation.
- 3) A number which when added to three times of itself gives 20 is _____
- 4) In a linear equation, the degree of the variable is _____
- 5) A number when multiplied by 4 exceeds itself by 24. The number is _____
- 6) $0.4x + 0.5 = 0.3x + 0.6$, then x is _____
- 7) The sum of two numbers which are in the ratio 5:7 is 120. Then the numbers are _____ and _____
- 8) If the value of x is 5, then $3x + \underline{\hspace{2cm}} = 20$
- 9) Two consecutive natural numbers whose sum is 55 are _____ and _____
- 10) The general form of linear equation is $ax+b=c$, where $a \neq \underline{\hspace{2cm}}$

Answer the following

- 1) The sum of two numbers is 43. The difference is 13. Find the numbers.
- 2) The present ages of husband and wife are in the ratio 4:3. Thirty years later, the husband will be 10 years older to her. What are their present ages?
- 3) The sum of three consecutive multiples of 3 is 333. Find the multiples.
- 4) Solve and verify your answer.

$$\frac{3}{2}(x+2)+4 = \frac{5x-4}{2} + \frac{5x}{4}$$

5) Solve : $\frac{2x - (7-5x)}{9x - (3+4x)} = \frac{7}{6}$

6) Solve : $\frac{3}{5x} - \frac{2}{3x} = \frac{1}{10}$

7) Find the value of a , if $(a+3)(a-3) - a(a+5) = 6$

- 8) Four-fifths of a number is 10 more than two-thirds of the number. Find the number.
- 9) Three consecutive integers add upto 54. What are the integers?
- 10) Solve : $\frac{3x-2}{4} - \frac{2x+3}{3} = \frac{2}{3} - x$
- 11) Find the value of a if : $15(a-4) - 2(a-9) + 5(a+6) = 0$
- 12) Two numbers are such that the ratio between them is 3:5. If each is increased by 10, the ratio between the new numbers so formed is 5:7. Find the original numbers.
- 13) The sum of three consecutive multiples of 9 is 999. Find these multiples.
- 14) Solve for x : $\frac{1 \cdot 2x + 3 \cdot 2}{3 \cdot 2x + 6 \cdot 4} = \frac{9}{8}$
- 15) Raja's piggy bank is full of one-rupee and 50p-coins. It contains three times as many 50p-coins as one-rupee coins. The total amount of money in the bank is ₹ 35. How many coins of each kind are there in the piggy bank.
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VIII

H.W - 22nd Feb (LE - Answers)

$$1) \frac{3x+5}{2x+1} = \frac{1}{3}$$

$$\Rightarrow (3x+5)3 = 2x+1$$

$$\Rightarrow 9x+15 = 2x+1$$

$$\Rightarrow 9x-2x = 1-15$$

$$\therefore 7x = -14$$

$$x = \frac{-14}{7} = -2 \text{ (a)}$$

$$2) \frac{2x+1}{5} = \frac{7}{5}$$

$$\Rightarrow \frac{2x}{5} = \frac{7}{5} - 1 = \frac{7-5}{5} = \frac{2}{5}$$

$$\therefore x = \frac{2}{5} \times \frac{5}{2} = 1 \text{ (c)}$$

3) Let the numbers be $2x$ and $5x$.

$$\text{Then, } 2x+5x = 21$$

$$\Rightarrow 7x = 21$$

$$\therefore x = \frac{21}{7} = 3$$

Thus, the numbers are $2 \times 3 = 6$ and $5 \times 3 = 15$ (c)

4) Let the number be x .

$$4x+8 = 5x-2$$

$$\Rightarrow 4x-5x = -2-8$$

$$\Rightarrow -x = -10$$

$$\therefore x = 10 \text{ (b)}$$

5) Let the number be x .

$$\text{Then, } 5x-7 = 2x+8$$

$$\Rightarrow 5x-2x = 8+7$$

$$\Rightarrow 3x = 15$$

$$\therefore x = \frac{15}{3} = 5 \text{ (b)}$$

$$6) \frac{x-3}{5} - 2 = -1$$

$$\Rightarrow \frac{x-3-10}{5} = -1$$

$$\Rightarrow x-13 = -5$$

$$\Rightarrow x = -5+13$$

$$\therefore x = 8 \text{ (c)}$$

$$7) \frac{x-3}{x+3} = \frac{5}{6}$$

$$\Rightarrow 6(x-3) = 5(x+3)$$

$$\Rightarrow 6x - 18 = 5x + 15$$

$$\Rightarrow 6x - 5x = 15 + 18$$

$$\therefore x = 33 \text{ (a)}$$

8) Let the number be x .

$$\text{Then, } x^2 + 15 = (x+1)^2 - 6$$

$$\Rightarrow x^2 + 15 = x^2 + 2x + 1 - 6$$

$$\Rightarrow 15 = 2x - 5$$

$$\Rightarrow 2x - 5 = 15$$

$$\Rightarrow 2x = 20$$

$$\therefore x = \frac{20}{2} = 10 \text{ (b)}$$

9) Let the number be x .

$$x - 27 = 35 - x$$

$$\Rightarrow x + x = 35 + 27$$

$$\Rightarrow 2x = 62$$

$$\therefore x = \frac{62}{2} = 31 \text{ (a)}$$

10) Let the present age be x years.

After 14 years, My age will be $(x+14)$ years

4 years ago, My age was $(x-4)$ years

$$\text{Then, } x+14 = 3(x-4)$$

$$\Rightarrow x+14 = 3x-12$$

$$\Rightarrow x - 3x = -12 - 14$$

$$\Rightarrow -2x = -26$$

$$\therefore x = \frac{26}{2} = 13 \text{ years (c)}$$

$$11) \frac{x^6}{2 \times 6} + \frac{x^4}{3 \times 4} - \frac{x^3}{4 \times 3} = 14$$

$$\Rightarrow \frac{6x + 4x - 3x}{12} = 14$$

\Rightarrow

$$7x = 14 \times 12$$

$$\therefore x = \frac{14 \times 12}{7} = 24 \text{ (d)}$$

$$12) \quad \frac{x-8}{3} = \frac{x-3}{2}$$

$$2(x-8) = 3(x-3)$$

$$2x - 16 = 3x - 9$$

$$2x - 3x = -9 + 16$$

$$-x = 7$$

$$x = -7 \text{ (b)}$$

fill in the blanks:-

1) linear

2) Solution

3) Let the number be x .

$$\text{Then, } x + 3x = 20$$

$$4x = 20$$

$$\therefore x = \underline{\underline{5}}$$

4) 1

5) Let the number be x

$$4x - x = 24$$

$$3x = 24$$

$$x = \frac{24}{3} = \underline{\underline{8}}$$

$$6) \quad 0.4x + 0.5 = 0.3x + 0.6$$

$$0.4x - 0.3x = 0.6 - 0.5$$

$$x = \frac{0.1}{0.1} = \underline{\underline{1}}$$

7) Let the numbers be $5x$ and $7x$

$$\text{Then, } 5x + 7x = 120$$

$$12x = 120$$

$$\therefore x = \frac{120}{12} = 10$$

Thus, the numbers are 50 and 70

$$8) \quad 3x + \frac{a}{2} = 20$$

$$\frac{a}{2} = 20 - 3x = 20 - 3 \times 5$$

$$\frac{a}{2} = 20 - 15 = \underline{\underline{5}}$$

9) Let the numbers be x and $x+1$.

$$\text{Then, } x+x+1 = 55$$

$$2x = 54$$

$$x = \frac{54}{2} = 27$$

Thus, the numbers are 27 and 28.

10) $a \neq 0$

Answer the following:-

1) Let the numbers be x and $43-x$.

$$\text{Then, } x - (43-x) = 13$$

$$x - 43 + x = 13$$

$$2x = 13 + 43 = 56$$

$$\therefore x = \frac{56}{2} = 28$$

Hence, the numbers are 28 and $43-28 = \underline{\underline{15}}$

2) Let the present ages be $4x$ and $3x$.

$$30 \text{ years later, husband's age} = 4x+30$$

$$\text{Wife's age} = 3x+30$$

$$\text{Then, } 4x+30 = 3x+30+10$$

$$4x-3x = 40-30$$

$$x = 10$$

Hence, their present ages are 40 years and 30 years.

3) Let the 3 multiples be x , $x+3$ and $x+6$.

$$\text{Then, } x+x+3+x+6 = 333$$

$$3x+9 = 333$$

$$3x = 324$$

$$x = \frac{324}{3} = 108$$

Hence, the multiples are 108, 111 and 114.

$$4) \frac{3}{2}(x+2) + 4 \times 2 = \frac{(5x-4) \times 2}{2 \times 2} + \frac{5x}{4}$$

$$\Rightarrow \frac{3x+6+8}{2} = \frac{10x-8+5x}{4}$$

$$(3x+14)4 = 2(15x-8)$$

$$12x+56 = 30x-16$$

$$12x-30x = -16-56$$

$$-18x = -72$$

$$x = \underline{\underline{4}}$$

Verification:-

$$\text{LHS, } \frac{3}{2}(x+2)+4 = \frac{3}{2}(4+2)+4 = \frac{3}{2} \times 6 + 4 = 9+4 = \underline{\underline{13}}$$

$$\text{RHS, } \frac{5x-4}{2} + \frac{5x}{4} = \frac{20-4}{2} + \frac{20}{4} = \frac{16}{2} + 5 = 8+5 = \underline{\underline{13}}$$

\therefore LHS = RHS. Hence verified.

$$5) \frac{2x - (7-5x)}{9x - (3+4x)} = \frac{7}{6}$$

$$\Rightarrow \frac{2x - 7 + 5x}{9x - 3 - 4x} = \frac{7}{6}$$

$$\Rightarrow \frac{7x - 7}{5x - 3} = \frac{7}{6}$$

$$6(7x-7) = 7(5x-3)$$

$$42x - 42 = 35x - 21$$

$$42x - 35x = -21 + 42$$

$$7x = 21$$

$$x = \frac{21}{7} = \underline{\underline{3}}$$

$$6) \frac{3^{3x} - 2^{5x}}{5x^{3x} \cdot 3x^{5x}} = \frac{1}{10}$$

$$\Rightarrow 9x - 10x = \frac{15x^3}{10^2}$$

$$\Rightarrow -x = \frac{3x^3}{2}$$

$$-2x = 3x^3$$

$$\therefore x = \underline{\underline{-\frac{2}{3}}}$$

$$7) (a+3)(a-3) - a(a+5) = 6$$

$$a^2 - 9 - a^2 - 5a = 6$$

$$-5a = 6 + 9$$

$$-5a = 15$$

$$\therefore a = \underline{\underline{-3}}$$

8) Let the number be x .

$$\frac{4x}{5} = \frac{2x}{3} + 10$$

$$\Rightarrow \frac{4x}{5 \times 3} - \frac{2x}{3 \times 5} = 10$$

$$\Rightarrow 12x - 10x = 150$$

$$2x = 150$$

$$\therefore x = \frac{150}{2} = 75$$

Hence, the number = 75

9) Let the three consecutive integers be $x, x+1$ and $x+2$.

$$x + x + 1 + x + 2 = 54$$

$$3x = 54 - 3 = 51$$

$$x = \frac{51}{3} = 17$$

\therefore The numbers are 17, 18 and 19.

$$10) \frac{(3x-2)^{\times 3}}{4 \times 3} - \frac{(2x+3)^{\times 4}}{3 \times 4} = \frac{2}{3} - \frac{x \times 3}{1 \times 3}$$

$$\Rightarrow \frac{(3x-2)3 - 4(2x+3)}{12} = \frac{2-3x}{3}$$

$$\Rightarrow \frac{9x-6-8x-12}{12} = \frac{2-3x}{3}$$

$$\Rightarrow 3(x-18) = 12(2-3x)$$

$$\Rightarrow 3x-54 = 24-36x$$

$$\Rightarrow 3x+36x = 24+54$$

$$\Rightarrow 39x = 78$$

$$x = \frac{78}{39} = \underline{\underline{2}}$$

$$11) 15(a-4) - 2(a-9) + 5(a+6) = 0$$

$$\Rightarrow 15a - 60 - 2a + 18 + 5a + 30 = 0$$

$$\Rightarrow 18a - 12 = 0$$

$$\Rightarrow 18a = 12$$

$$\therefore a = \frac{12}{18} = \frac{2}{3}$$

12) Let the numbers be $3x$ and $5x$

$$\frac{3x+10}{5x+10} = \frac{5}{7}$$

$$\Rightarrow 7(3x+10) = 5(5x+10)$$

$$\Rightarrow 21x+70 = 25x+50$$

$$\Rightarrow 21x-25x = 50-70$$

$$\Rightarrow -4x = -20$$

$$x = \frac{20}{4} = 5$$

\therefore The numbers are 15 and 25.

13) Let the three consecutive multiples be $x, x+9$ and $x+18$.
Then, $x + x + 9 + x + 18 = 999$

$$3x + 27 = 999$$

$$3x = 999 - 27 = 972$$

$$x = \frac{972}{3} = \underline{\underline{324}}$$

Hence, the multiples are 324, 333 and 342.

14)
$$\frac{1.2x + 3.2}{3.2x + 6.4} = \frac{9}{8}$$

$$\Rightarrow 8(1.2x + 3.2) = 9(3.2x + 6.4)$$

$$\Rightarrow 9.6x + 25.6 = 28.8x + 57.6$$

$$\Rightarrow 9.6x - 28.8x = 57.6 - 25.6$$

$$\therefore -19.2x = 32$$

$$x = -\frac{32}{19.2} = -\frac{\cancel{320}^{160-80-20} 5}{192 \ 96 \ 48 \ 24 \ 12 \ 6 \ 3} = -\frac{5}{3}$$

15) Let the no. of one-rupee coins be x and that of 50p coins be y .

Then, $y = 3x \rightarrow (1)$

Also, $1 \times x + \frac{50}{100} \times y = 35$

$$\Rightarrow x + \frac{1}{2}y = 35$$

$$\Rightarrow x + \frac{1}{2} \times 3x = 35 \text{ [from eq: (1)]}$$

$$\Rightarrow 2x + 3x = 70$$

$$5x = 70$$

$$x = \frac{70}{5} = \underline{\underline{14}}$$

$$y = 3 \times 14 = \underline{\underline{42}}$$

\therefore No. of one-rupee coins = 14

no. of 50p coins = 42