Tender Heart High School, Sec-33 B, Chandigarh

Class - VI
Subject - Mathematics

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Teacher - Ms. Sushma

Chapter - 13
Simple Equations

Equation in one variable :→

A statement of equality in one variable is called an equation in that variable. eg :- $x^2 - 1 = 8$, $2z - 3 = 7$

Linear Equation :→

An equation in one variable with highest power '1' is called a linear equation in that variable. eg :- $x - 3 = 5$, $3y + 2 = 8$

The sign of equality in an equation divides it into two sides, namely the Left Hand Side and the Right Hand Side written as L.H.S and R.H.S. respectively.

Solution of an Equation :→

The value of the variable which when substituted in the given equation makes L.H.S = R.H.S., is called a solution or root of the given equation.

Exercise 13A

1. Solve :-

(i) $x - 4 = 8$

$x = 8 + 4$

$\boxed{x = 12}$

(ii) $x + 7 = 2$

$x = 2 - 7$

$\boxed{x = -5}$

(iii) $x - 6 = -3$

$x = -3 + 6$

$\boxed{x = 3}$

(iv) $y + 2 = -6$

$y = -6 - 2$

$\boxed{y = -8}$

2. Solve :-

(i) $\frac{x}{3} = 6$

$x = 6 \times 3$

$\boxed{x = 18}$

(ii) $\frac{y}{2} = -4$

$y = -4 \times 2$

$\boxed{y = -8}$

(iii) $\frac{2x}{4} = 3$

$2x = 3 \times 4$

$2x = 12$

$x = \frac{\cancel{12}^{6}}{\cancel{2}_{1}}$

$\boxed{x = 6}$

3. Solve :-

(i) $2x = 10$

$x = \frac{\cancel{10}^{5}}{\cancel{2}_{1}} \Rightarrow \boxed{x = 5}$

(ii) $3y = -12$

$y = \frac{-\cancel{12}^{4}}{\cancel{3}_{1}}$

$\boxed{y = -4}$

(iii) $2x-3=7$

$2x=7+3$

$2x=10$

$x=\frac{10^{5}}{2_{1}}$

$\boxed{x=5}$

(iv) $3x-5=4$

$3x=4+5$

$3x=9$

$x=\frac{9^{3}}{3_{1}}$

$\boxed{x=3}$

(v) $4x-1=7$

$4x=7+1$

$4x=8$

$x=\frac{8^{2}}{4_{1}}$

$\boxed{x=2}$

(vi) $5z-3=2$

$5z=2+3$

$5z=5$

$z=\frac{5^{1}}{5_{1}}$

$\boxed{z=1}$

Q4. Solve:-

(i) $2x-3=-5$

$2x=-5+3$

$2x=-2$

$x=\frac{-2^{1}}{2_{1}}$

$\boxed{x=-1}$

(ii) $4y+5=-3$

$4y=-3-5$

$4y=-8$

$y=\frac{-8^{2}}{4_{1}}$

$\boxed{y=-2}$

(iii) $6z-8=1$

$6z=1+8$

$6z=9$

$z=\frac{9^{3}}{6_{2}} \Rightarrow z=\frac{3}{2}$

Rule of Transposition:→

A term on one side of an equation can be shifted to the other side with change in its sign.

Exercise 13B

Solve:-

1. $5x + 4 = 19$

$5x = 19 - 4$

$5x = 15$

$x = \frac{15}{5_1}\ ^3$

$\boxed{x = 3}$

2. $3x - 8 = 10$

$3x = 10 + 8$

$3x = 18$

$x = \frac{18}{3_1}\ ^6$

$\boxed{x = 6}$

3. $5 - 2y = 9$

$-2y = 9 - 5$

$-2y = 4$

$y = -\frac{4}{2_1}\ ^2$

$\boxed{y = -2}$

4. $-6 + 3x = -5$

$3x = -5 + 6$

$3x = 1$

$\boxed{x = \frac{1}{3}}$

5. $2x + 12 = 3 - x$

$2x + x = 3 - 12$

$3x = -9$

$x = -\frac{9}{3_1}\ ^3$

$\boxed{x = -3}$

6. $2 - 5y = 2y - 5$

$-5y - 2y = -5 + (-2)$

$-5y - 2y = -5 - 2$

$-7y = -7$

$y = \frac{-7_1}{-7_1}$

$\boxed{y = 1}$

7. $\frac{x}{5} + 5 = 2$

$\frac{x}{5} = 2 - 5$

$\frac{x}{5} = -3$

$x = -3 \times 5$

$\boxed{x = -15}$

8. $\frac{4x}{3} + 3 = x - 2$

$\frac{4x}{3} - x = -2 - 3$

$\frac{4x - 3x}{3} = -5$

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

$x = -5 \times 3$

$\boxed{x = -15}$

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

$3x + 2 = 4 \times 5$

$3x + 2 = 20$

$3x = 20 - 2$

$3x = 18$

$x = \frac{18}{3_1}^{6}$

$\boxed{x = 6}$

10. $\frac{x}{2} - 6 = \frac{x}{3} - 5$

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

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

$3x - 2x = 1 \times 6$

$\boxed{1x = 6}$

11. $\frac{2y}{3} - 8 = 2 - y$

$\frac{2y}{3} + y = 2 + 8$

$\frac{2y + 3y}{3} = 10$

$\frac{5y}{3} = 10 \Rightarrow 5y = 30$

$y = \frac{30^{6}}{5_1} \Rightarrow \boxed{y = 6}$

12. $\frac{x}{2} + 2 = 5 - x$

$\frac{x}{2} + \frac{x}{1} = 5 - 2$

$\frac{x + 2x}{2} = 3$

$\frac{3x}{2} = 3$

$3x = 3 \times 2$

$3x = 6$

$x = \frac{6^{2}}{3_{1}}$

$\boxed{x = 2}$

13. $6(2x-1) - 5(x-3) = 2(x+2)$

$12x - 6 - 5x + 15 = 2x + 4$

$7x + 9 = 2x + 4$

$7x - 2x = 4 - 9$

$5x = -5$

$x = \frac{-5^{1}}{5_{1}}$

$\boxed{x = -1}$

14. $7(3x-1) - 6(2x+3) = 8(x-2) + 1$

$21x - 7 - 12x - 18 = 8x - 16 + 1$

$\Rightarrow 21x - 12x - 8x = -16 + 1 + 7 + 18$

$21x - 20x = -16 + 26$

$\boxed{x = 10}$