

## LINEAR EQUATIONS

### Exercise 31. One Variable

Written

**Example 1:** Solve:  $\frac{x+3}{4} - \frac{x+4}{6} = \frac{x}{2} - 2$ .

Multiply both sides by the L.C.D. of 12. Indicate the multiplications, then do it in the next step.

$$3(x+3) - 2(x+4) = 6x - 24$$

$$3x + 9 - 2x - 8 = 6x - 24$$

$$-5x = -25$$

$$x = 5$$

Solve each of the following on the domain of rational numbers.

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

2.  $\frac{a}{3} - 2a = -10$

3.  $\frac{m}{6} = \frac{m}{2} - \frac{1}{3}$

4.  $\frac{x}{4} - x = \frac{x}{3} + \frac{1}{2}$

5.  $\frac{x}{7} - \frac{x}{3} = \frac{2}{3}$

6.  $\frac{b}{15} - \frac{2b}{5} + 3 = 0$

7.  $\frac{a}{11} + \frac{3a}{2} = \frac{7}{4}$

8.  $\frac{x+1}{6} - \frac{x}{8} = -\frac{3}{4}$

9.  $\frac{x+2}{12} = \frac{x-1}{9}$

10.  $\frac{2m-1}{3} - \frac{m}{2} = \frac{m-2}{5}$

11.  $2a + 3 - \frac{a-1}{6} - \frac{a}{4} = 0$

12.  $\frac{7x-4}{3} - x + \frac{x}{5} = 4 - \frac{x}{3}$

13.  $\frac{4x}{9} - \frac{10}{3} = \frac{x-7}{6}$

14.  $\frac{2p-7}{13} - \frac{p}{2} - \frac{16}{13} = 0$

15.  $\frac{9a-3}{2} = -\frac{3a-6}{9} - \frac{13}{6}$

**Example 2:** Solve  $\frac{3}{4}(x-1) = \frac{1}{3}(x-2)$ , on the domain

$\{-2, -\frac{1}{2}, \frac{1}{10}, \frac{5}{6}, 2, 4.1, 6, 14, 46.5\}$ .

Remove the parentheses.

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

Clear of fractions, using the L.C.D. of 12.

$$9x - 9 = 4x - 8$$

$$5x = 1$$

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

Since  $\frac{1}{5} \notin D$ , the solution set is empty.