Worksheet 2015-9EF-00002(1)

Solve the following equations:

(1) $\frac{x}{5} + \frac{1}{3} = \frac{x}{6}$ LCD = 30

$\frac{x}{\cancel{5}} \times \frac{\cancel{30}^{6}}{1} + \frac{1}{\cancel{3}} \times \frac{\cancel{30}^{10}}{1} = \frac{x}{\cancel{6}} \times \frac{\cancel{30}^{5}}{1}$

$6x + 10 = 5x$

$6x - 5x = -10$

$x = -10$

(2) $\frac{2}{3y} + 1 = \frac{5}{6y}$ LCD = $6y \rightarrow 6y \neq 0$ $\therefore y \neq 0$

$\frac{2}{\cancel{3y}} \times \frac{\cancel{6y}^{2}}{1} + \frac{1}{1} \times \frac{6y}{1} = \frac{5}{\cancel{6y}_{1}} \times \frac{\cancel{6y}^{1}}{1}$

$2 \times 2 + 1 \times 6y = 5 \times 1$

$4 + 6y = 5$

$6y = 5 - 4$

$6y = 1$

$y = \frac{1}{6}$

(3) $\frac{6k}{5} - \frac{4k}{5} = 1\frac{1}{2}$ LCD = 10

$\frac{6k}{5} - \frac{4k}{5} = \frac{3}{2}$

$\frac{6k}{\cancel{5}} \times \frac{\cancel{10}^{2}}{1} - \frac{4k}{\cancel{5}} \times \frac{\cancel{10}^{2}}{1} = \frac{3}{\cancel{2}} \times \frac{\cancel{10}^{5}}{1}$

$6k \times 2 - 4k \times 2 = 3 \times 5$

$12k - 8k = 15$

$4k = 15$

$k = \frac{15}{4} = 3\frac{3}{4}$

(4) $\frac{(3p-1)}{2} = \frac{(4-p)}{3}$ LCD = 6

$\frac{6^3}{1} \times \frac{(3p-1)}{2} = \frac{6^2}{1} \times \frac{(4-p)}{3}$

$3 \times (3p-1) = 2 \times (4-p)$

$9p - 3 = 8 - 2p$

$9p + 2p = 8 + 3$

$11p = 11$

$p = \frac{11}{11} = 1$

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

$\frac{^1\cancel{6}}{1} \times \frac{x}{\cancel{6}} + \frac{\cancel{6}^2}{1} \times \frac{2x}{\cancel{3}} - \frac{^3\cancel{6}}{1} \times \frac{1}{\cancel{2}} = \frac{\cancel{6}^3}{1} \times \frac{x}{\cancel{2}}$

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

$x + 4x - 3 = 3x$

$5x - 3x = 3$

$2x = 3$

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

(6) $4 - \frac{2}{t} = \frac{3}{2t}$ LCD = $2t$ → $2t \neq 0$ ∴ $t \neq 0$

$\frac{2t}{1} \times \frac{4}{1} - \frac{2\cancel{t}}{1} \times \frac{2}{\cancel{t}} = \frac{^1\cancel{2t}}{1} \times \frac{3}{\cancel{2t}}$

$2t \times 4 - 2 \times 2 = 1 \times 3$

$8t - 4 = 3$

$8t = 3 + 4$

$8t = 7$

$t = \frac{7}{8}$

(7) $\frac{(2k+2)}{5} = \frac{k}{4} - \frac{(k-1)}{2}$ LCD = 20

$4 \frac{20}{1} \times \frac{(2k+2)}{5} = \frac{20}{1} \times \frac{k}{4} - \frac{20}{1} \times \frac{(k-1)}{2}$

$4 \times (2k+2) = 5 \times k - 10 \times (k-1)$

$8k + 8 = 5k - 10k + 10$

$8k + 8 = -5k + 10$

$8k + 5k = 10 - 8$

$13k = 2$

$k = \frac{2}{13}$

(8) $7 - \frac{y}{4} = \frac{2y}{7} + 7$ LCD = 28

$-\frac{y}{4} = \frac{2y}{7} + 7 - 7$

$-\frac{y}{4} = \frac{2y}{7}$

$7 \frac{28}{1} \times \frac{-y}{4} = \frac{28}{1} \times \frac{2y}{7}$

$7 \times -y = 4 \times 2y$

$-7y = 8y$

$-7y - 8y = 0$

$-15y = 0$

$y = \frac{0}{-15}$

$y = 0$

(9) $\frac{3}{4} + m = \frac{m}{3} + 1$ LCD = 12

$\frac{\cancel{12}^{3}}{1} \times \frac{3}{\cancel{4}} + \frac{12}{1} \times \frac{m}{1} = \frac{\cancel{12}^{4}}{1} \times \frac{m}{\cancel{3}} + \frac{12}{1} \times \frac{1}{1}$

$3 \times 3 + 12 \times m = 4 \times m + 12 \times 1$

$9 + 12m = 4m + 12$

$12m - 4m = 12 - 9$

$8m = 3$

$m = \frac{3}{8}$

(10) $\frac{2(n-3)}{4} = \frac{3}{4} + \frac{n}{2}$ LCD = 4

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

$1 \times 2(n-3) = 1 \times 3 + 2 \times n$

$2n - 6 = 3 + 2n$

$2n - 2n = 3 + 6$

$0 = 9$??

No $\mathbb{R}$-solution