Solving Linear and Fractional Equations

Step1: Remove parentheses by using the Distributive Property.
Step 2: Combine like terms.
Step 3: Isolate the variable.

1. Solve each equation.

a) $15(2-x)=-3(-x+2)$

$30-\cancel{15x}=3x-6$

$\cancel{+15x}\quad +15x$

$30=18x-6$

$+6 \qquad +6$

$\frac{36}{18}=\frac{18x}{18}$

$\boxed{x=2}$

b) $5x - 1(x-8) = 12x$

$5x - 1x + 8 = 12x$

$4x + 8 = 12x$

$-4x \qquad -4x$

$\frac{8}{8} = \frac{8x}{8}$

$\boxed{x = 1}$

c) $10 - 4(2x+1) - 3(x-4) = -9x + 4 - 4x$

$10 - 8x - 4 - 3x + 12 = -9x + 4 - 4x$

$18 - 11x = -13x + 4$

$+13x \qquad +13x$

$18 + 2x = 4$

$-18 \qquad -18$

$\frac{2x}{2} = \frac{-14}{2}$

$\boxed{x = -7}$

d) $\frac{2}{5}x + \frac{15}{1} = \frac{31}{1}$

$$\frac{2x}{5} + \frac{15}{1} \cdot \frac{5}{5} = \frac{31}{1} \cdot \frac{5}{5} \quad LCD = 5$$

$$\frac{2x}{5} + \frac{75}{5} = \frac{155}{5}$$

$$2x + \cancel{75} = 155$$
$$-75 \quad -75$$

$$\frac{2x}{2} = \frac{80}{2}$$

$$\boxed{x = 40}$$

e) $\frac{1}{3}(4a+9)=11-2(a-5)$

$$\frac{4a+9}{3}=\frac{11\cdot 3}{1\cdot 3}-\frac{2\cdot 3(a-5)}{1\cdot 3}$$

LCD = 3

$$\frac{4a+9}{\cancel{3}}=\frac{33}{\cancel{3}}-\frac{6(a-5)}{\cancel{3}}$$

$$4a+9=33-6(a-5)$$

$$4a+9=33-6a+30$$

$$4a+9=63-6a$$

$$+6a \qquad +6a$$

$$10a+9=63$$

$$-9 \qquad -9$$

$$\frac{10a}{10}=\frac{54}{10}$$

$$\boxed{a=5.4}$$

f) $\frac{3}{2}y=12-\frac{5}{2}y$

$$\frac{3y}{2}=\frac{12\cdot 2}{1\cdot 2}-\frac{5y}{2}$$

LCD = 2

$$\frac{3y}{\cancel{2}}=\frac{24}{\cancel{2}}-\frac{5y}{\cancel{2}}$$

$$3y=24-5y$$

$$+5y \qquad +5y$$

$$\frac{8y}{8}=\frac{24}{8}$$

$$\boxed{y=3}$$

g) $\frac{1}{3}m+\frac{1}{4}m+\frac{1}{5}m=\frac{47}{60}$

$$\frac{20\cdot m}{20\cdot 3}+\frac{15\cdot m}{15\cdot 4}+\frac{12\cdot m}{12\cdot 5}=\frac{47}{60}$$

LCD = 60

$$\frac{20m}{60}+\frac{15m}{60}+\frac{12m}{60}=\frac{47}{60}$$

$$20m+15m+12m=47$$

$$\frac{47m}{47}=\frac{47}{47}$$

$$\boxed{m=1}$$

h) $2b-.24=.4-3b$

$$2.00b-.24=.40-3.00b$$

$$200b-24=40-300b$$
$$+300b \qquad\qquad +300b$$

$$500b-24=40$$
$$+24 \quad +24$$

$$\frac{500b}{500}=\frac{64}{500}$$

$$b=\frac{64\div 4}{500\div 4}=\boxed{\frac{16}{125}}$$

i) $.35x - .2 = .15x + .1$

$$.35x - .20 = .15x + .10$$

$$35x - 20 = 15x + 10$$

$$-15x \qquad\qquad -15x$$

$$20x - 20 = 10$$

$$+20 \quad +20$$

$$\frac{2\cancel{0}}{\cancel{2}0}x = \frac{30}{20}$$

$$x = \frac{3\cancel{0}}{2\cancel{0}} = \boxed{\frac{3}{2}}$$