

Useful Guidelines:

To solve a Linear Equation in One Variable:

- * Eliminate the fractions: Multiply both sides by the least common denominator as needed.
- * Clear parentheses and combine like terms as needed.
- * Get all terms with the variable on one side of the equation and all numbers on the other side.
- * Get an equation with just the variable on one side of the equation.

*no Good
no job.*

Zero of a Function: Any number a , for which $f(a) = 0$, is called a zero of the function $f(x)$. If a is real, a is an x -intercept of the graph of the function. [Zeros of the function: solutions to the equation $f(x) = 0$.]

Solve the following linear equations in one variable:

1. a) $\frac{4x+3}{4} - \frac{x-1}{2} = 5$ LCD = 4

$$4 \left[\frac{4x+3}{4} - \frac{x-1}{2} \right] = [5] 4 \quad 2x+5 = 20$$

$$= (4x+3) - 2(x-1) = (20) \quad \frac{2x}{2} = \frac{15}{2}$$

$$= 4x+3 - 2x+2 = 20 \quad \boxed{x = \frac{15}{2}}$$

2. a) $0.04z + 0.02(z-5) = 0.01z + 0.25$ LCD = 100

$$100 \left[\frac{4}{100}z + \frac{2}{100}(z-5) \right] = \left[\frac{1}{100}z + \frac{25}{100} \right] 100$$

$$4z + 2(z-5) = 1z + 25 \quad = 6z = 1z + 35$$

$$4z + 2z - 10 = 1z + 25 \quad -1z \quad -1z$$

$$6z - 10 = 1z + 25 \quad = 5z = 35$$

$$\frac{5z}{5} = \frac{35}{5} \quad \boxed{z = 7}$$

3. For the function $f(x) = 45 + 15x$, find:

a) $f(-3)$

$$f(-3) = 45 + 15(-3)$$

$$45 - 45 = 0$$

$$\boxed{f(-3) = 0}$$

so next!

c) The x -intercept of the graph of $f(x) = 45 + 15x$

$$0 = 45 + 15x$$

$$\frac{-15x}{-15} = \frac{45}{-15}$$

$$\boxed{x = -3}$$

b) $\frac{3}{4}x - \frac{2}{7} = \frac{5}{7}x + \frac{1}{2}$ LCD = 28

$$28 \left[\frac{3}{4}x - \frac{2}{7} \right] = \left[\frac{5}{7}x + \frac{1}{2} \right] 28$$

$$21x - 8 = 20x + 14$$

$$\begin{matrix} +8 & +8 \\ 21x & = 20x + 22 \end{matrix}$$

$$\frac{-20x}{-20x} = \frac{22}{-20x} \quad \boxed{x = 22}$$

b) $1.39 - 0.15x = 2.41x + 0.11$ LCD = 100

$$139 - 15x = 241x + 11$$

$$+15x \quad +15x$$

$$139 = 256x + 11$$

$$-11 \quad -11$$

$$\frac{128}{256} = \frac{256x}{256}$$

$$\boxed{x = 2}$$

b) The solution to the equation $f(x) = 0$

$$45 + 15x = 0$$

$$-15x \quad -15x$$

$$45 = -15x \quad \boxed{x = -3}$$

$$\frac{45}{-15} = \frac{-15x}{-15}$$

d) The zero of $f(x) = 45 + 15x$.

$$0 = 45 + 15x$$

$$-15x = 45$$

$$\frac{-15x}{-15} = \frac{45}{-15}$$

$$\boxed{x = -3}$$

4. The future value of a simple interest investment is given by $S = P(1 + rt)$. What principal P must be invested for twenty years at the simple interest rate of 5% so that the future value grows to \$300,000?

$$300,000 = P(1 + .05(20))$$

$$300,000 = P(1 + 1)$$

$$\frac{300,000}{2} = \frac{2P}{2}$$

$$\boxed{P = \$150,000}$$

$$S = 300,000$$

$$P = ?$$

$$r = .05 (5\%)$$

$$t = 20 \text{ years}$$