

1.

a) $\frac{x}{4} + 2 = 2x - \frac{3}{2}$

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

$$x + 8 = 8x - 6$$

$$8 + 6 = 8x - x$$

$$14 = 7x$$

$$x = \frac{14}{7} \rightarrow \underline{x=2}$$

b) $\frac{x-1}{2} = \frac{3x-10}{5} + \frac{x-2}{3}$

$$\frac{15x-15}{30} = \frac{18x-60}{30} + \frac{10x-20}{30}$$

$$15x-15 = 18x-60+10x-20$$

$$15x-18x-10x = -60-20+15$$

$$-13x = -65$$

$$x = \frac{-65}{-13} = \frac{65}{13} = \underline{5}$$

2.

1) $x(2x-3) - 3(5-x) = 83$

$$2x^2 - 3x - 15 + 3x = 83$$

$$2x^2 - 15 - 83 = 0$$

$$2x^2 - 98 = 0$$

$$2x^2 = 98$$

$$x^2 = \frac{98}{2} = 49$$

$$x = \pm \sqrt{49} = \begin{cases} \underline{x=+7} \\ \underline{x=-7} \end{cases}$$

2) $(2x+5)(2x-5) = 11$

$$4x^2 - 25 = 11$$

$$4x^2 = 11 + 25$$

$$4x^2 = 36$$

$$x^2 = \frac{36}{4} = 9$$

$$x = \pm \sqrt{9} = \pm 3 \begin{cases} \underline{x=+3} \\ \underline{x=-3} \end{cases}$$

3) $(7+x)^2 + (7-x)^2 = 130$

$$49 + 14x + x^2 + 49 - 14x + x^2 = 130$$

$$2x^2 + 49 + 49 = 130$$

$$2x^2 = 130 - 49 - 49$$

$$2x^2 = 32$$

$$x^2 = \frac{32}{2} = 16$$

$$x = \pm \sqrt{16} = \pm 4 \begin{cases} \underline{x=+4} \\ \underline{x=-4} \end{cases}$$