

1. (18pts) Solve the equations.

$$10 + 2(3 - x) = 5 - 3(x - 2)$$

$$10 + 6 - 2x = 5 - 3x + 6$$

$$16 - 2x = 11 - 3x \quad | +3x$$

$$16 + x = 11 \quad | -16$$

$$x = -5$$

$$\frac{x+1}{4} + \frac{3x-7}{10} = 2 + \frac{x-1}{5} \quad | \cdot \text{LCD} = 20$$

$$\frac{x+1}{4} \cdot \frac{5}{5} + \frac{3x-7}{10} \cdot \frac{2}{2} = 2 \cdot 20 + \frac{x-1}{5} \cdot \frac{4}{4}$$

$$5x+5 + 6x-14 = 40 + 4x-4$$

$$11x-9 = 36 + 4x \quad | -4x$$

$$7x = 45$$

$$x = \frac{45}{7}$$

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

$$2(x+4) + \frac{2x+1}{\cancel{x+4}} \cdot \cancel{(x+4)} = \frac{x-3}{\cancel{x+4}} \cdot \cancel{(x+4)}$$

$$2x+8 + 2x+1 = x-3$$

$$4x+9 = x-3 \quad | -x$$

$$3x = -12$$

$$x = -4$$

↪ gives 0 in denominator,

so no solution

2. (14pts) You inherit \$10,000 and can invest it in two different investments, one paying 6%, and the other paying 9%. If you wish to have 10,500 after 9 months, how much should you invest in each account?

x = amt. put in account paying 6%

$$-175 = -0.0225x$$

$$500 = x \cdot 0.06 \cdot \frac{9}{12} + (10,000 - x) \cdot 0.09 \cdot \frac{9}{12}$$

$$x = \frac{175}{0.0225} = 7777.78$$

total interest = interest from account at 6% + interest from account at 9%

$$500 = 0.045x + (10000 - x) \cdot 0.0675$$

$$500 = 0.045x + 675 - 0.0675x \quad | -675$$

\$7777.78 goes to acct. at 6%
 \$2222.22 " " " at 9%

3. (14pts) How many liters water must be mixed with 2 liters of a 22% solution of muriatic acid in order to get a 15% solution?



$x =$ liters of water added.

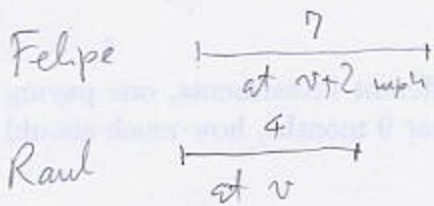
$$0.22 \cdot 2 + 0 = 0.15(x+2)$$

$$0.44 = 0.15x + 0.3 \quad | -0.3$$

$$0.14 = 0.15x$$

$$x = \frac{0.14}{0.15} = 0.9333 \text{ liters}$$

4. (14pts) Roommates Felipe and Raul like to ride their bicycles, and Felipe rides 2mph faster. If Felipe rides $\frac{7}{3}$ miles in the same time that Raul rides 4 miles, how fast is each of them going?



} in same time

$$3v = 8$$

$$v = \frac{8}{3} \text{ mph} \quad \frac{8}{3} + 2 = \frac{14}{3}$$

$$s = v \cdot t$$

$$t = \frac{s}{v}$$

$$\frac{7}{v+2} = \frac{4}{v}$$

$$7v = 4(v+2)$$

$$7v = 4v + 8 \quad | -4v$$

Raul rides at $\frac{8}{3}$ mph

Felipe rides at $\frac{14}{3}$ mph