§1.2 #13, 61, 83 & §1.4 #103

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$ Solve for R_1

$$LCD = RR_1R_2R_3$$

$$\left(\frac{1}{R}\right)\left(\frac{R_1R_2R_3}{RR_1R_2R_3}\right) = \left(\frac{1}{R_1}\right)\left(\frac{RR_2R_3}{RR_1R_2R_3}\right) + \left(\frac{1}{R_2}\right)\left(\frac{RR_1R_3}{RR_1R_2R_3}\right) + \left(\frac{1}{R_3}\right)\left(\frac{RR_1R_2}{RR_1R_2R_3}\right) \Longrightarrow$$

$$\frac{R_1R_2R_3}{LCD} = \frac{RR_2R_3 + RR_1R_3 + RR_1R_2}{LCD}$$

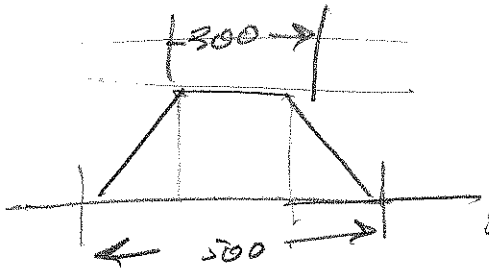
$$R_1R_2R_3 = RR_2R_3 + RR_1R_3 + RR_1R_2$$

$$R_1R_2R_3 - RR_1R_3 - RR_1R_2 = RR_2R_3$$

$$R_1\left(R_2R_3 - RR_3 - RR_2\right) = RR_2R_3$$

$$R_1 = \frac{RR_2R_3}{R_2R_3 - RR_3 - RR_2}$$

§1.2 #61



$$\text{Area} = \left(\frac{b_1 + b_2}{2}\right) h$$

$500 = b_1 =$ base / length

$300 = b_2 =$ " 2 "

$h = ?$

h = "height" of the trapezoid (ft)

Given Area of trap is 90,000 ft^2

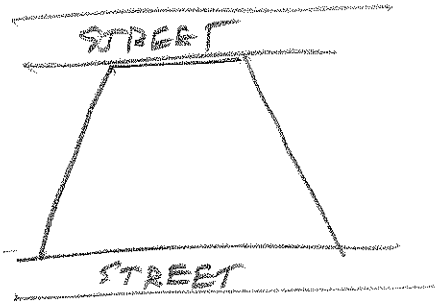
$$\text{Area} = \text{Area}$$

$$\left(\frac{b_1 + b_2}{2}\right) h = 90{,}000$$

$$\left(\frac{300 + 500}{2}\right) h = 90000$$

$$400h = 90000$$

$$h = \frac{90000}{400} = \frac{450}{2} = 225 \text{ ft} = h$$



#13, #61, #83

#83 How many gallons of 15% alcohol to be mixed with how many gals of 10% alc. to obtain 20 gals of 12% alc.

Mixtures: 2 eq'ns

TOTAL VOL = TOTAL VOL

Amt Pure = Amt Pure

Let x = amt of 15% alc. (gal)

y = " " 10% alc. (gal)

TOTAL: $x + y = 20 \rightarrow y = 20 - x$

Pure: $.15x + .10y = (.12)(20)$

UNITS ANALYSIS

$\left(\frac{.12 \text{ gal pure alc}}{1 \text{ gal } 12\% \text{ alc}}\right)(20 \text{ gal of } 12\% \text{ alc})$

$\left(\frac{.15 \text{ gal pure alc.}}{1 \text{ gal } 15\% \text{ alc.}}\right)\left(x \text{ gal } 15\% \text{ alc}\right)$

FINDING How Much pure alcohols in there.

83 cont'd

So

$$.15x + .10(20 - x) = 2.4$$

§1.4 # 103

$49/person minus $1/person for each additional person

c = cost/person ($/person)

n = # of people

How much does she make on a tour of 40 people.

$1 off everybody's ticket, for each additional person.

$c = 49 - n$

$$\text{Revenue} = \left(\frac{\text{cost}}{\text{person}}\right)\left(\#\text{ of people}\right)$$

$$= (49 - (n-1))n$$

$$= 49n - n(n-1)$$

$$= 49n - n^2 + n$$

$$= -n^2 + n + 49$$

SET 0 $\Rightarrow$ $n^2 - n - 49 = 0$

$\Rightarrow n^2 - n + \left(\frac{1}{2}\right)^2 = 49 + \frac{1}{4} = \frac{196+1}{4} = \frac{197}{4}$

Looks suspiciously like WP #1 prob.

$x^2 - 5x - 11 = 0$

$x^2 - 5x + \left(\frac{5}{2}\right)^2 = 11 + \frac{25}{4} = \frac{44 + 25}{4} = \frac{69}{4}$

$-5 \rightarrow -\frac{5}{2} \rightarrow \left(\frac{5}{2}\right)^2$

3 | 69
23

$\left(x - \frac{5}{2}\right)^2 = \frac{69}{4}$

$\sqrt{\left(x - \frac{5}{2}\right)^2} = \sqrt{\frac{69}{4}} = \frac{\sqrt{69}}{\sqrt{4}} = \frac{\sqrt{69}}{2}$

$\left|x - \frac{5}{2}\right| = \frac{\sqrt{69}}{2}$

$x - \frac{5}{2} = \pm \frac{\sqrt{69}}{2}$

$x = \frac{5 \pm \sqrt{69}}{2}$

5.5 #7

$6x^2 - 13x + 5 = 0$ $\quad (5)(6) = +30$

$6x^2 - 10x - 3x + 5 = 0$ $\quad -13 = -1 + 14$ ~~-1~~

$2x(3x-5) - 1(3x-5)$ $\quad -13 = -12 - 1$ $\quad 12$

$2x\left(\frac{6x^2}{2x} - \frac{10x}{2x}\right)$ $\quad = -1 - 12$ $\quad 22$

$= -10 - 3$ $\quad 30$

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

2|6 $\quad$ 2|10
3 $\quad$ 5

The "-1" is kind of invisible, in front of the 2nd $(3x-5)$

$2 \cdot 3 \cdot x^2$ $\quad$ $2 \cdot 5 \cdot x$

GCF $= 2 \cdot x$