FROM NOW ON, QUIZZES ARE ***CLOSED BOOK, OPEN NOTES***.

Today- Shared Work, Mixtures } 5.1.2 Roundup.

I can do an oil change in 20 minutes
How many oil changes can I get done in 5 hrs? (300 min)

$$\left(\frac{1 \text{ job}}{20 \text{ minutes}}\right)(300 \text{ minutes}) = \frac{300}{20} = 15 \text{ jobs done.}$$

I can paint a can in 6 hrs
Jill can .. .. 5 hrs
How long does it take us working together?
In one hour, I'm $\frac{1}{6}$ of the way done.

$$\frac{1 \text{ job}}{6 \text{ hrs}} \cdot t \text{ hrs} + \frac{1 \text{ job}}{5 \text{ hrs}} \cdot t \text{ hrs} = 1 \text{ job}$$

$$\frac{1}{6}t + \frac{1}{5}t = 1 \qquad \text{LCD} = 5 \cdot 6 = 30$$

$$\frac{t}{6} \cdot \frac{5}{5} + \frac{t}{5} \cdot \frac{6}{6} = \frac{30}{30}$$

$$\frac{5t + 6t}{30} = \frac{30}{30}$$

$$11t = 30$$

$$t = \frac{30}{11}$$

Ditch LCD

t = time it takes working together (hrs)

Same s:tch. J:ll's 1 hours late for work. Steve starts @ 8 am. When do they finish?

Let t = time steve spends on the job (hrs)

Then J:ll (lazy!) spends $t-1$ hrs on the job. And so

LCD = 5·6 = 30

$$\frac{1}{6}t + \frac{1}{5}(t-1) = 1$$

$$\frac{t}{6}\cdot\frac{5}{5} + \left(\frac{t-1}{5}\right)\left(\frac{6}{6}\right) = \frac{30}{30}$$

$$5t + 6(t-1) = 30$$

$$5t + 6t - 6 = 30$$

$$11t = 36$$

$$t = \frac{36}{11} = 3.27272727\ldots$$

$-(t-1) = -t-1$ ← Most common error on Q1. Should be $(t-1) = -t+1$

$(3)\left(\frac{3}{11}\right)$

$3\frac{3}{11}$

$3 + \frac{3}{11}$

$\left(.\overline{27}\ \text{hrs}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right)$

$\left(\frac{3}{11}\ \text{hrs}\right)\left(\frac{60\ \text{min}}{\text{hr}}\right) = 16.36\ \text{min} \approx 16\ \text{min}$

So 8 am + 3 hrs, 16 min.

11:16 am is when they're done.

Mixture Probs

How much 30% alcohol must be mixed with 5 L of 70% alcohol, to make a 45% alcohol mix?

	30%	70%	45%
TOTAL VOL	x	5 L	$x+5$
PURE ALCOHOL	$.3x$	$(.7)(5)$	$.45(x+5)$

Let x = Amt of 30% alcohol (in L)

$$.3x = \left(\frac{.3 \text{ L alc.}}{1 \text{ L soln}}\right)(x \text{ L soln})$$

$.3x + 3.5 = .45(x+5)$ etc.

If we want 100 L of 45% soln, but don't know how much of either one?

	30%	70%	45%
TOT	x	y	100
Pure	$.3x$	$.7y$	$.45(100)$

$$x + y = 100$$
$$.3x + .7y = .45(100)$$