1-mile track

Bobby's got a 2-lap head start & averages 90 $\frac{mi}{hr}$. How fast does Ricky have to go to end in a tie after the 10 laps?

	r	t	D
Bobby	90	t	8
Ricky	x	t	10

$$\frac{D}{r} = t = t = \frac{D}{r}$$

$$\frac{8}{90} = \frac{10}{x} \qquad LCD = 90x$$

$$\frac{8}{90} \cdot \frac{x}{x} = \frac{10}{x} \cdot \frac{90}{90}$$

$$\frac{8x}{LCD} = \frac{900}{LCD}$$

$$8x = 900$$

$$x = \frac{900}{8} = 112.5 \ \frac{mi}{hr}$$

Another version of §1.2 #47
(#10 MyLab)

16 Labs
Bobby's goin' 88 $\frac{mi}{hr}$
Ricky starts after Bobby's made 6 laps

	D	r	t
Bobby	10	88	t
Ricky	16	x	t

$t = t$ (same!)

$D = rt \Rightarrow t = \frac{D}{r}$

$= \frac{10}{88} = \frac{16}{x}$

This time, just cross-multiply or multiply everything by LCD = 88x

$\Rightarrow 10x = (16)(88)$

$\Rightarrow x = \frac{(16)(88)}{10}$

$= \frac{(8)(88)}{5}$

$= 140.8$

88 | 704
8
704

http://harryzaims.com/121-all/videos/ is where everything I built is found.

click to follow link

Materials specific to our section:

http://harryzaims.com/121-all/121-fall-16/g16/

Syllabus, schedule, sign up for MyLab.

HOMEWORK'S ABOUT MASTERY, not points!

Figuring out stuff >>> perfect homework

You give it a good shot?

Full credit.

Just don't "game" it for points.

The POINTS live in the TESTS

§ 1.1 #41

$$\frac{z+2}{z-3} = \frac{5}{-3}$$

The general technique I push goes back to basic adding of fractions.

$$\frac{7}{24} + \frac{11}{50}$$

LCD:

$24 = 2 \cdot 12 = 2 \cdot 2 \cdot 6 = 2 \cdot 2 \cdot 2 \cdot 3$

$12 = 11$

2, 3, 5, 7, 11, 13, 17, 19

$50 = 2 \cdot 25 = 2 \cdot 5 \cdot 5$

$325 = 7 \cdot 175$

$$\left(\frac{7}{2 \cdot 2 \cdot 2 \cdot 3}\right)\left(\frac{5 \cdot 5}{5 \cdot 5}\right) + \left(\frac{11}{2 \cdot 5 \cdot 5}\right)\left(\frac{2 \cdot 2 \cdot 3}{2 \cdot 2 \cdot 3}\right)$$

$$= \frac{175}{LCD} + \frac{132}{LCD} = \boxed{\frac{307}{LCD}}$$

LCD = Least common multiple of denoms, (It's smallest number that owns all the factors.)

$2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 \cdot 5 = LCD$

$$\frac{z+2}{z-3} = \frac{5}{-3} = \frac{-5}{3}$$

LCD = $3(z-3)$

$$\left(\frac{z+2}{z-3}\right)\left(\frac{3}{3}\right) = \left(\frac{-5}{3}\right)\left(\frac{z-3}{z-3}\right)$$

$$\frac{3(z+2)}{LCD} = \frac{-5(z-3)}{LCD}$$

$$3(z+2) = -5(z-3)$$

$$3z+6 = -5z+15$$

$$+5z-6 = +5z-6$$

$$8z = 9$$

$$\frac{8z}{8} = \frac{9}{8}$$

$$z = \frac{9}{8}$$

$$\frac{x}{5} = \frac{13}{5}$$

← Quicker ways to get here, I know. But I'm training you for $\frac{x^2-3x+2}{x^2+5x-6} > \frac{11}{x+3}$

← Trying to get you to skip this step. You'll see why, later!

Solve for M_1

$$\frac{1}{M} = \frac{1}{M_1} + \frac{1}{M_2} + \frac{1}{M_3}$$

$LCD = MM_1M_2M_3$

Clear fracs is another method. It's faster for THESE, but will NOT work for this:

$$\frac{x^2-5x+6}{x^2-9} > x+5$$

Inequalities take my more lengthy approach from previous page(s).

Clear Fracs:

$$MM_1M_2M_3\left[\frac{1}{M} = \frac{1}{M_1} + \frac{1}{M_2} + \frac{1}{M_3}\right]$$

$$M_1M_2M_3 = MM_2M_3 + MM_1M_3 + MM_1M_2$$

FROM $\left(\frac{MM_1M_2M_3}{1}\right)\left(\frac{1}{M_1}\right)$

$$\Rightarrow M_1M_2M_3 - MM_1M_3 - MM_1M_2 = MM_2M_3$$

$$\Rightarrow M_1(M_2M_3 - MM_3 - MM_2) = MM_2M_3$$

$$\Rightarrow M_1 = \frac{MM_2M_3}{M_2M_3 - MM_3 - MM_2}$$

Solve for x:

$3xy + 5xz = 1$ Factor out x

$x(3y+5z) = 1$ Divide by big marty coefficient of x.

$\frac{x(3y+5z)}{(3y+5z)} = \frac{1}{3y+5z}$

$x = \frac{1}{3y+5z}$

S' 1.2 #49

	r	D	t
1st half:	80	d	$t_1 = \frac{d}{80}$
2nd half	x	d	$t_2 = \frac{d}{x}$

we know $\frac{x+80}{2} = 60$

$x+80 = 120$

$x = 40$ you'd think!

Somehow, it's 48?!

$$\text{Avg Rate} = 60 = \frac{2d}{\frac{d}{80} + \frac{d}{x}}$$

$$= \frac{2d}{\frac{dx+80d}{80x}} = (2d)\left(\frac{80x}{dx+80d}\right) = \frac{160dx}{dx+80d}$$

$$= \frac{160dx}{d(x+80)} = \frac{160x}{x+80} = 60$$

$$160x = 60(x+80)$$

$$160x = 60x + 480$$

$$100x = 480$$

$$x = 48$$

$$4 + \frac{6}{y-3} = \frac{2y}{y-3} \qquad \mathcal{D} = \{y \mid y \neq 3\}$$

$y=3$ makes stuff / 0 ← BAD!

$$\left(\frac{y-3}{y-3}\right)(4) + \frac{6}{y-3} = \frac{2y}{y-3}$$

$$\frac{4y-12}{y-3} + \frac{6}{y-3} = \frac{2y}{y-3} \quad \ldots \Rightarrow y = 3 \notin \mathcal{D}$$

DOMAIN

$\frac{\text{STUFF}}{0}$, $\sqrt{\text{negative}}$ BAD

Everything else is good

Apples $1.20 / $\frac{1}{4}$-lb

Apricots $1.80 / $\frac{1}{4}$-lb

$(20)(1.68)(4) =$ Total $

want 20 lbs worth $1.68 / $\frac{1}{4}$-lb

Convert lbs to $\frac{1}{4}$-lbs units

Let x = # of lbs of apples

& y = # " " " apricots

we know $x + y = 20 \Rightarrow y = 20 - x$

$\left(4 \frac{\frac{1}{4}\text{-lbs}}{1\text{ lb}}\right)\left(1.20 \frac{\$}{\frac{1}{4}\text{-lb}}\right) x + \left(4 \frac{\frac{1}{4}\text{-lbs}}{1\text{ lb}}\right)\left(1.80 \frac{\$}{\frac{1}{4}\text{-lb}}\right)(20 - x) = 80(1.68)$

$\frac{\$}{\text{lb}}$ lb. $\frac{\$}{\text{lb}}$ lbs

$4(20)(1.68)$

$(\text{lbs})\left(\frac{\$}{\text{lb}}\right) = \$$

Since it

$$(4)(1.20)x + (4)(1.80)(20 - x) = 4(20)(1.68)$$

#31 $(x_1, y_1) = (\pi, 0)$

$(x_2, y_2) = (\frac{\pi}{2}, 1)$

$(\frac{2}{2})(\pi) + \frac{\pi}{2} = \pi(1 + \frac{1}{2}) = \pi(\frac{3}{2})$

$\text{midpt} = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = \left(\frac{\pi+\frac{\pi}{2}}{2}, \frac{0+1}{2}\right) = \left(\frac{\frac{3\pi}{2}}{2}, \frac{1}{2}\right)$

$= \left(\frac{3\pi}{4}, \frac{1}{2}\right)$

$\text{Dist} = \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$

$= \sqrt{\left(\pi - \frac{\pi}{2}\right)^2 + (0-1)^2}$

$\pi - \pi/2 = \pi(1 - 1/2) = \pi(1/2) = \pi/2$

$= \sqrt{\left(\frac{2\pi}{2} - \frac{\pi}{2}\right)^2 + (-1)^2}$

$= \sqrt{\left(\frac{\pi}{2}\right)^2 + 1}$

$= \sqrt{\frac{\pi^2}{4} + 1} = \sqrt{\frac{\pi^2+4}{4}}$

$= \frac{\sqrt{\pi^2+4}}{\sqrt{4}} = \frac{\sqrt{\pi^2+4}}{2}$