

Rate Problems

Using a table is often Extremely helpful!

Ex 1 Two friends, Mario + Shania, share a paper route. Shania can deliver the papers in 40 min. Mario takes 50 minutes. How long, to the nearest minute, do they take if they work together?

	Time to deliver pap.	Fraction done in 1 min	Fraction done in t minutes
Shania	40	$\frac{1}{40}$	$\frac{1}{40} \cdot t = \frac{t}{40}$
Mario	50	$\frac{1}{50}$	$\frac{1}{50} \cdot t = \frac{t}{50}$
Together	t	$\frac{1}{t}$	$\frac{1}{t} \cdot t = 1$

Shania + Mario = Whole paper route

$$\frac{t}{40} + \frac{t}{50} = 1$$

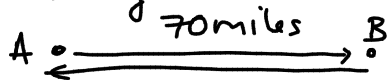
$$\cancel{40} \cdot 50 \cdot \frac{t}{\cancel{40}} + \cancel{40} \cdot \cancel{50} \cdot \frac{t}{\cancel{50}} = 1 \cdot 40 \cdot 50$$

$$50t + 40t = 2000$$

$$\frac{90t}{90} = \frac{2000}{90}$$

$$t = 22.2 \text{ or } \underline{\underline{22 \text{ minutes}}}$$

Camryn runs a race. She runs a total of 140 miles.



On the way back, bad weather decreased her speed by 6 mph. The total time was $8\frac{1}{2}$ hrs.

What was her average speed on the first half of the race?

$$\text{speed} = \frac{\text{distance}}{\text{time}} \quad \text{or} \quad \text{time} = \frac{\text{distance}}{\text{speed}}$$

	Dist.	Rate	Time	
1 st half	70	x	$\frac{70}{x}$	$\frac{d}{\text{speed}}$
2 nd half	70	$x-6$	$\frac{70}{x-6}$?	
Totals:	140		$8\frac{1}{2}$	✓

There back

$$\left(8\frac{1}{2} = \frac{17}{2}\right)$$

$$2x(x-6) \frac{70}{x} + \frac{70 \cdot 2 \cdot x \cdot (x-6)}{(x-6)} = \frac{17 \cdot 2x(x-6)}{2}$$

$$2(x-6)(70) + 70 \cdot 2x = 17 \cdot x(x-6)$$

$$140(x-6) + 140x = 17x(x-6)$$

$$140x - 840 + 140x = 17x^2 - 102x$$

$$280x - 840 = 17x^2 - 102x$$

$$-280x + 840 = -280x + 840$$

$$17x^2 - 382x + 840 = 0$$

$$x = 20 \text{ mph}$$

$$\text{or } x = 2.47 \text{ mph} - 6 \text{ mph}$$

Today's Assignment

⇒ hand in by Tuesday.

Pg 349 # 9, 12, 13, 14, 17, 19
-351
Seet 6.4← FiestDue by ThursdayPg 352 #3, 6b, 9-11, 13-15, 20, 22, 23
-354(Review)TEST IS THURS# 9 x and $x+1$ are 2 consecutive #'s.Add 6 to the first number: $x+6$ 2 is subtracted from the second: $x+1-2$
 $= x-1$ The quotient : $\frac{x+6}{x-1}$ is $\frac{9}{2}$

so : $\frac{(x+6)}{(x-1)} = \frac{9}{2}$