Notes

Algebra 2 Section 9.6 Word Problems Name_____

Distance Formula: **distance traveled = rate of speed x time traveled**

d = r t so $t = \frac{d}{r}$

Example 1: Backwoods Sam can paddle his canoe 50 miles upstream against the current in the same time he can paddle 75 miles downstream with the current. The current is flowing at 3 miles per hour. Find Sam's paddling rate in still water.

p = paddling rate

	r	• t	= d
Upstream	$p-3$	$\frac{50}{p-3}$	50
Downstream	$p+3$	$\frac{75}{p+3}$	75

$$\frac{50}{p-3} = \frac{75}{p+3}$$

$$50p + 150 = 75p - 225$$

$$375 = 25p$$

$$15 \text{ mph} = p$$

Work formula: **work done = rate of work (per unit of time) x time on job**

w = r t

Example 2. Jeff can build a brick wall in 5 days. Sergio can build the same wall in 4 days. Working together, how long will it take them to build the wall?

x = time both on job

(per day) (on job)

	r	• t	= w
Jeff	$\frac{1}{5}$	x	$\frac{x}{5}$
Sergio	$\frac{1}{4}$	x	$\frac{x}{4}$

$$20\left(\frac{x}{5} + \frac{x}{4} = 1\right) \text{(job)}$$

$$4x + 5x = 20$$

$$9x = 20$$

$$x = 2\frac{2}{9} \text{ days}$$

Example 3. A painter works on a job for 10 days and is then joined by his associate Together they finish the job in 6 more days. The associated would have done the job alone in 30 days. How long would it take the painter alone to do the job?

(per day) (on job)

	r	• t	= w
painter	$\frac{1}{x}$	16	$\frac{16}{x}$
associate	$\frac{1}{30}$	6	$\frac{1}{5}$

$$5x\left(\frac{16}{x} + \frac{1}{5} = 1\right)$$

$$80 + x = 5x$$

$$80 = 4x$$

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