Algebra 2 Section 9.6 Word Problems Name_____

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

$d = r\,t$ $\quad t = \frac{d}{r}$

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.

r = Sam's rate

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

$\frac{50}{12}$ $\quad \frac{50}{r-3} = \frac{75}{r+3}$ $\quad \frac{75}{18}$

$r = 15$ mph

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? (t)

	(per day) r • (t) = (job) w		
Jeff	$\frac{1}{5}$	t	$\frac{t}{5}$
Sergio	$\frac{1}{4}$	t	$\frac{t}{4}$

$$20\left(\frac{t}{5} + \frac{t}{4} = 1\right)$$

$t = 2\frac{2}{9}$ 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 associate would have done the job alone in 30 days. How long would it take the painter alone to do the job?

per day

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

(job)

$\frac{16}{r} + \frac{1}{5} = 1$

or $\frac{16}{r} = \frac{4}{5}$

r = painter's days alone to do job

20 days = r