

7. Two pumps are used to fill a water storage tank at a resort. One pump can fill the tank by itself in 9 hours, and the other can fill it in 6 hours. How long will it take both pumps operating together to fill the tank?

	WR	R	WD
Pump A	$\frac{1}{9}$	$t$	$\frac{t}{9}$
Pump B	$\frac{1}{6}$	$t$	$+$ $\frac{t}{6}$

$$\frac{t}{9} + \frac{t}{6} = 1$$

$$6t + 9t = 54$$

$$15t = 54$$

$$t = 3.6 \text{ hours}$$

8. A chemical storeroom has an 80% alcohol solution and a 30% alcohol solution. How many milliliters of each should be used to obtain 50 milliliters of a 60% solution?

	mL	%	Total
Sol 1	$x$	80	$80x$
Sol 2	$50 - x$	30	$+ 1500 - 30x$
New Sol	50	60	3000

$$80x + 1500 - 30x = 3000$$

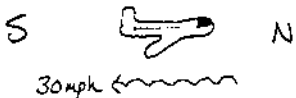
$$50x = 1500$$

$$x = 30 \text{ mL of the } 80\% \text{ Sol}$$

$$50 - x = 20 \text{ mL of the } 30\% \text{ Sol}$$

9. The cruising speed of an airplane is 150 miles per hour. You plan to hire the plane for a 3-hour sightseeing trip you instruct the pilot to fly north as far as she can and still return to the airport at the end of the allotted time. How far north should the pilot fly if the wind is blowing from the north at 30 miles per hour?

	Rate	Time	Distance
NORTH	$150 - 30 = 120$	$t$	$x$
SOUTH	$150 + 30 = 180$	$3 - t$	$x$



$$120t = x$$

$$t = \frac{x}{120}$$

$$180(3 - t) = x$$

$$3 - t = \frac{x}{180}$$

$$3 - \frac{x}{180} = t$$

$$360 \left( \frac{x}{120} \right) = \left( 3 - \frac{x}{180} \right) 360$$

$$3x = 1080 - 2x$$

$$5x = 1080$$

$$x = 216 \text{ mi}$$