1. A plane normally flys 190 mph if there is no wind. Today there is a 10 mph wind.

a. How fast would the plane actually travel if it flies with the wind (**tailwind**)?

$$190 + 10 = 200 \text{ mph}$$

b. How fast would the plan actually travel if it flies against the wind (**headwind**)?

$$190 - 10 = 180 \text{ mph}$$

c. How far could the plane fly in 2.25 hrs if it flys with a tailwind?

$$d = r \cdot t = 200(2.25) = 450 \text{ miles}$$

d. How far could the plane fly in 2.5 hours if it flys with a headwind?

$$d = r \cdot t = 180(2.5) = 450 \text{ miles}$$

2. A plane flys **P** mph without any wind and the wind is blowing **W** mph.

a. Write an expression for the speed of the plane with a tailwind.

$$P + W$$

b. Write an expression for the speed of the plane with a headwind.

$$P - W$$

c. Write an equation using $d = r \cdot t$ to model the fact that the plane flies 720 miles from one city to another city with a <u>headwind</u> in 3.6 hours.

$$720 = 3.6(P - W)$$

d. Write an equation using $d = r \cdot t$ to model the fact that the plane flies the 720 mile return trip between the same two cities with a tailwind in 3 hours.

$$720 = 3(P + W)$$

e. Solve this system of equations to find the speed of the wind **W** and the speed the plane can fly with no wind **P**.

$$720 = 3.6P - 3.6W$$
$$720 = 3P + 3W$$

- or -

$$200 = P - W$$
$$+ \ 240 = P + W$$
$$\overline{440 = 2P}$$
$$220 = P$$

$$W = 20$$

Speed of the plane = 220 mph
Speed of the wind = 20 mph