1- A projectile is thrown from the origin with an initial velocity V_o = (20 i + 98 j) m/s. If the projectile hits a target that is at a horizontal distance of 400 m away, what is the time of flight of the projectile?

$$\Delta X = 400 \ m$$
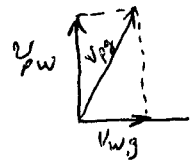
$$V_{ox} = 20 \ \frac{m}{s}$$

$$a_x = 0 \quad (\text{Projectile motion})$$

$$t = ?$$

use $\quad \Delta X = V_{ox} t \Rightarrow t = \frac{\Delta X}{V_{ox}} = \frac{400}{20} = 20 \ S$

2- An airplane is moving due North at a speed of 150 m/s. It faces a wind with speed of 40 m/s due East. Calculate the speed of the airplane with respect to the ground.

$$\vec{V}_{pg} = \vec{V}_{pw} + \vec{V}_{wg}$$

$$= (150 \ \hat{j} + 40 \ \hat{i}) \ \frac{m}{s}$$

$$speed = |\vec{V}_{pg}| = \sqrt{150^2 + 40^2} \approx 155 \ \frac{m}{s} .$$