

You have just moved to the California coastal town of San Cruzan. You notice that the beach town has an amusement park so you decide to visit as the sun sets.

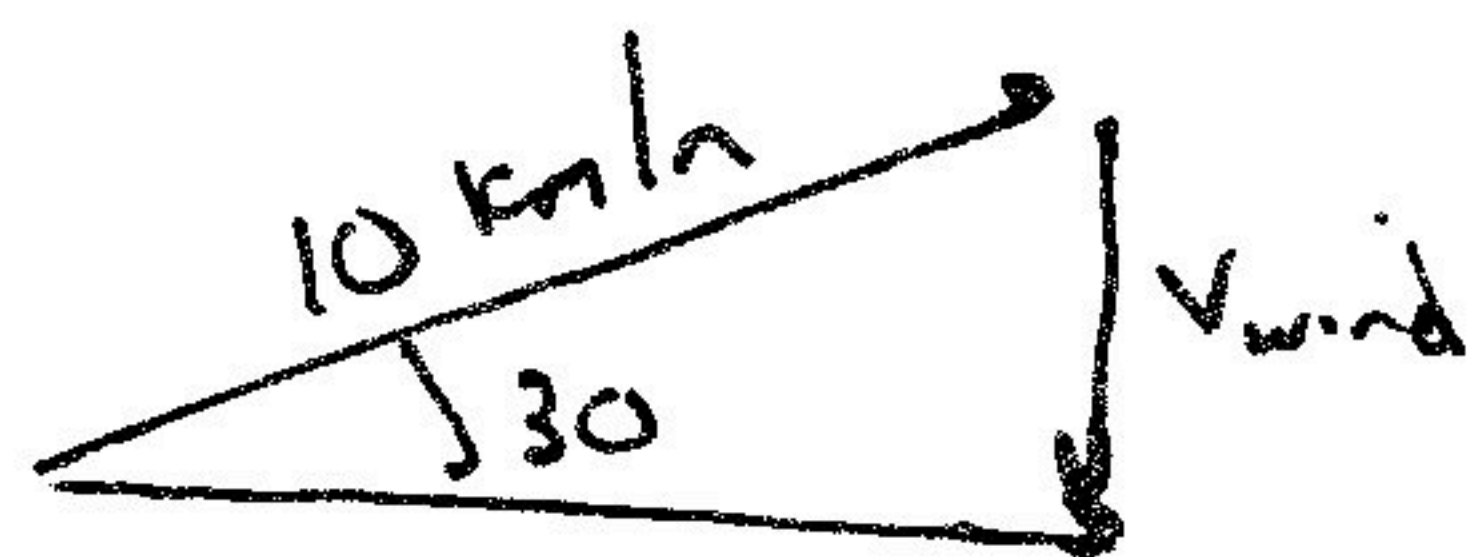
1a-8 pts) You observe all the lights and motion, and decide to estimate how much power is consumed per person visiting the amusement park. If a typical evening has 1000 riders, each ride consumes 10 kW of power (power = energy/time), and there are 20 rides, estimate how much energy is consumed per rider in a typical 5-hour evening?

$$E = \frac{10 \frac{\text{kW}}{\text{ride}} \cdot 20 \text{ rides} \cdot 5 \text{ hours}}{1000 \text{ riders}} = 1 \text{ kW-hr / rider}$$

1b-7) You decide to ride FreeFall. This ride drops you from a high height at an acceleration of  $5 \text{ m/s}^2$ . Determine your apparent weight, assuming you have a mass of 60 kg?

$$\begin{aligned} W &= m(g - a) = 60 \text{ kg} (9.8 \text{ m/s}^2 - 5 \text{ m/s}^2) \\ &= 288 \text{ N} \end{aligned}$$

1c-10 pts) You look up into the sky and see something that looks suspiciously like a bat. You estimate that the bat is flying with an airspeed of 10 km/hr flies perpendicular to the wind coming off the bay. The bat's nose is pointed into the offshore wind at 30 degrees from the perpendicular direction of flight. Determine the speed of the offshore wind?



$$\begin{aligned} v_{\text{wind}} &= \sin 30^\circ \cdot 10 \text{ km/hr} \\ &= 5 \text{ km/hr} \end{aligned}$$