Physics 220
Period_____

Worksheet
Speed and Velocity

Name_____

$$\frac{330.\ km}{4.25\ hr} = 77.6\ km/hr$$

1. What must be your average speed in order to travel 330. km in 4.25 hours?

2. A bird can fly 25 km/hr. How long will it take to fly 18 km? $V = \frac{d}{t}$ $t = \frac{d}{V} = \frac{18\ km}{25\ km/hr} = .72\ h \times \frac{60\ m}{1\ h} = 43\ min$

3. 55 miles per hour is how many (1 mile = 5280 ft = 1609 m) (a) km/hr (b) m/s (c) ft/sec

4. A person jogs eight complete laps around a quarter-mile track in a total time of 13.5 min. Calculate (a) the average speed and (b) the average velocity, in m/s.

5. Calculate the average speed and average velocity of a complete round trip in which the first 200. km is covered at 90 km/hr, followed by a one-hour lunch break, and the final 200. km is covered at 50 km/hr.

6. An 18-year old runner can complete a 10.0 km course with an average speed of 4.38 m/s. A 50-year old runner can cover the same distance with an average speed of 4.27 m/s. How much later should the younger runner start in order to finish the course at the same time as the older runner?

7. A skydiver, with parachute unopened, falls 625m in 15.0 seconds. Then she opens her parachute and falls another 356 m in 142 seconds. What is her average velocity (both magnitude and direction) for the entire fall?

3)
a)
$\frac{55\ mi}{hr} \times \frac{1609\ m}{1\ mi} \times \frac{1\ km}{1000\ m} = 88\ km/hr$

b)
$\frac{88\ km}{hr} \times \frac{1000\ m}{1\ km} \times \frac{1\ hr}{3600\ s} = 24\ m/s$

c)
$\frac{55\ mi}{hr} \times \frac{5208\ ft}{1\ mi} \times \frac{1\ hr}{3600\ s} = 81\ ft/s$

6)
$d = 10.0\ km$

$V_{18} = \frac{d}{t_{18}}$ $t_{18} = \frac{d}{V_{18}} = \frac{1.0 \times 10^4\ m}{4.38\ m/s} = 2.28 \times 10^3\ s$

$V_{50} = \frac{d}{t_{50}}$ $t_{50} = \frac{d}{V_{50}} = \frac{1.0 \times 10^4\ m}{4.27\ m/s} = 2.34 \times 10^3\ s$

$= .06 \times 10^3\ s$
$= 60\ s$
$= 1\ min$

4)
a)
$.25\ mil \times 8 = \frac{2\ miles}{13.5\ min} = .148\ mil/min \times \frac{60\ min}{1\ hr} = 8.89\ mi/hr$

$\frac{8.89\ mi}{hr} \times \frac{1\ hr}{3600\ s} \times \frac{1609\ m}{1\ mi}$
$= 3.97\ m/s$

b) $0\ m/s$

5) 200. km @ 90 km/hr $t = \frac{d}{v} = \frac{200.\ km}{90\ km/hr} = 2\ hr$

0 km @ 1 hr.

200. km @ 50 km/hr $t = \frac{d}{v} = \frac{200.\ km}{50\ km/hr} = 4\ hr$

$\frac{400.\ km}{7\ hr} = 60\ km/hr$ $\bar{V} = 0\ m/s$ (round trip)

7.) $\bar{V} = \frac{625\ m + 356\ m}{157\ s}$
$= 6.25\ m/s$ downward