**2 Dimensional Motion Mock Test**

**1. George runs 5.0 m/s horizontally off the edge of a 9.2 m tall cliff and lands in the water.**

a. What time is he in the air? (1.37 s)

b. What distance from the bottom of the cliff does he land? (6.85 m)

c. What is his speed of impact? (14.3 m/s)

**2. Simone fires a flaming digital projectile at a speed of 13 m/s at an angle of 71o above the horizontal on a long level firing range.**

a. What are the initial horizontal and vertical components of velocity? (4.232 m/s x + 12.29 m/s y)

b. What time is the projectile in the air, and what distance does it go before hitting the ground?

(2.51 s, 10.6 m)

c. What is the greatest height the projectile reaches, and what is its velocity at that height? (7.71 m, 4.23 m/s)

**3. Add these two vectors, and express the answer as an angle magnitude vector:**

62o

11 m

13 m

58o

 (17.6 m, 70.6o above the + x axis)

**4. Magenta Antelope drifts down the mighty Tualatin River. She goes 25 m downstream in 13 seconds. Then she points her canoe straight across the river, and paddles across the 114 m wide river in 43 seconds.**

a. What is the speed of the current? (1.92 m/s)

b. What speed did she paddle the canoe through the water? How far downstream did she go in crossing?

(2.65 m/s, 82.7 m)

c. What is her speed as seen from above as she crosses? (3.28 m/s)

d. What angle upstream of straight across should she point to go straight across the river? (46.5o)