Name _____Answer Key_____ Date _____
Honors Physics Vectors/Projectiles WS #10H
Period _____ Mrs. Nadworny

A

Angled Projectiles

Directions: Read textbook pages 102 -104. Solve the following problems using the GUESS method. Show ALL work neatly using proper units and significant figures.

1. A golf ball is hit at an angle of 45° above the horizontal. What is the acceleration of the golf ball at its highest point in its trajectory? [Neglect friction]

   A) 0.0 m/s^2
   B) 6.9 m/s^2 horizontally
   C) 9.8 m/s^2 upward
   D) 9.8 m/s^2 downward

2. The path of a projectile fired at a 30° angle to the horizontal is best described as

   A) circular B) parabolic C) linear D) hyperbolic

3. For a projectile launched at an angle, if it takes 4 seconds to reach the highest point, the total flight time is ___8 seconds_____.

4. Rhoda Bote throws a rock into the air with an initial speed of 49.0 m/s at an angle of 58.0^0 with the horizontal. It returns to Earth at the same level from which it was launched.

   a. Calculate the initial vertical speed of the rock.

$$v_{iy} = v_i \sin\theta = (49.0\,\tfrac{m}{s})(\sin 58.0°) = 41.6\,\tfrac{m}{s}$$

   b. Calculate the initial horizontal speed of the rock.

$$v_{iy} = v_i \cos\theta = (49.0\,\tfrac{m}{s})(\cos 58.0°) = 26.0\,\tfrac{m}{s}$$

   c. Calculate how long it was in the air.

Use that $v_f = 0$ at the top

$$t_{top} = \frac{\Delta v}{a} = \frac{0\,\frac{m}{s} - 41.6\,\frac{m}{s}}{-9.81\,\frac{m}{s^2}} = 4.24s$$

$$t_{total} = 2 \times t_{top} = 2(4.24s) = 8.48s$$

   d. Calculate how far away it landed.

$$d_x = v_{ix} t = 26.0\,\tfrac{m}{s}(8.48s) = 220.m$$

	x	y
d		
		0 m
t		
a	0 m/s^2	-9.81 m/s^2
v_i		
v_f		0 m/s

Answers in size order: 8.48, 26.0, 41.6, 220.