

Practice Exam 1, PHY 1301, Fall 2014

1. A furlong is a distance of 220 yards. A fortnight is a time period of 2 weeks. A race horse is running at a speed of 5 yards per second. What is his speed in furlongs per fortnight?
 - a. 27,491 furlongs/fortnight
 - b. 13,674 furlongs/fortnight
 - c. 6,221 furlongs/fortnight
 - d. 2,749 furlongs/fortnight
2. Water flows into a swimming pool at the rate of 8 gal/min. The pool is 16 ft wide, 32 ft long and 8 ft deep. How long does it take to fill? (1 U.S. gallon = 231 cubic inches)
 - a. 32 hours
 - b. 64 hours
 - c. 48 hours
 - d. 24 hours
3. The following wind velocities act on a boat: i) 50 m/s at 45° north of east and ii) 25 m/s at 30° south of east. Which of the following represents the magnitude of the resultant (total) boat velocity and its angle relative to the easterly direction?
 - a. 75.0 m/s, 7.50°
 - b. 61.4 m/s, 21.8°
 - c. 23.4 m/s, 18.3°
 - d. 12.8 m/s, 37.5°
4. Arvin the Ant travels 30 cm eastward, then 25 cm northward and finally 15 cm westward. What is Arvin's directional displacement with respect to his original position?
 - a. 59° N of E
 - b. 29° N of E
 - c. 29° N of W
 - d. 77° N of E
5. A rock is thrown straight up with an initial velocity of 24.5 m/s. What maximum height will the rock reach before starting to fall downward?
 - a. 9.8 m
 - b. 19.6 m
 - c. 24.5 m
 - d. 30.6 m
6. At the top of a cliff 100 m high, Raoul throws a rock upward with velocity 15 m/s. How much later should he drop a second rock from rest so both rocks arrive simultaneously at the bottom of the cliff?
 - a. 5.05 s
 - b. 3.76 s
 - c. 2.67 s
 - d. 1.78 s

7. Norma releases a bowling ball from rest; it rolls down a ramp with constant acceleration. After half a second it has traveled 0.75 m. How far has it traveled after two seconds?

- a. 1.2 m
- b. 4.7 m
- c. 9.0 m
- d. 12 m

8. A baseball thrown from the outfield is released from shoulder height at an initial velocity of 29.4 m/s at an initial angle of 30° with respect to the horizontal. What is the maximum vertical displacement that the ball reaches during its trajectory?

- a. 11.0 m
- b. 9.8 m
- c. 22.1 m
- d. 44.1 m

9. An Olympic downhill skier (mass = 80 kg) races down a 30° slope. If he starts from rest and the track is 50 m long, what is his final velocity at the bottom of the hill ?

- a. 22.15 m/s
- b. 33.25 m/s
- c. 40.45 m/s
- d. 12.35 m/s

10. A 250 kg crate is placed on an adjustable inclined plane. If the crate slides down the incline with an acceleration of 0.7 m/s^2 when the incline angle is 25° , then what should the incline angle be for the crate to slide down the plane at constant speed?

- a. 12°
- b. 21°
- c. 25°
- d. 29°

11. Two blocks of masses 20 kg and 8 kg touch each other and rest on a frictionless level surface. A person pushes horizontally on the 8 kg box with a force of 14 N. Then what is the contact force between the blocks?

- a. 14 N
- b. 6 N
- c. 10 N
- d. 4.0 N