Kinematics Mastery Test

Physics 11

Name:

Show all your work and calculations to earn full assessment credit. No graphing calculators or phones are allowed during a test. Good Luck.
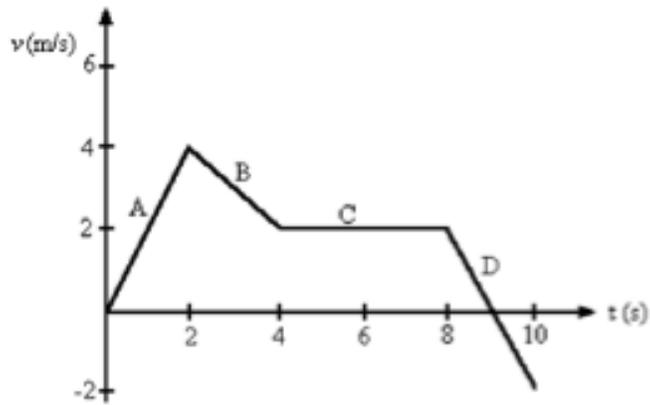
1. A wrench is thrown in space between two astronauts. If they are 56m away and the wrench was thrown at 0.7m/s then how long will it take for the wrench to reach the second astronaut?

2. The Cookie Monster and Oscar are in a tight race to get some cookies that are 35m away. Oscar maintains a constant speed of 3.7 m/s for the entire race. The Cookie Monster runs for 10m at 3.4 m/s, then he takes a rest for 2 seconds. How fast must he run for the final leg to beat Oscar?

3. An Aliens is on another planet. They jump with an initial velocity of 4.6m/s and raise to a maximum height of 12.3m. What is the acceleration of gravity on this planet?
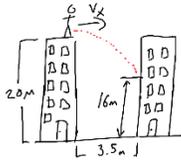
4. Use the graph to answer the following questions.

a) What is the displacement of the object in the graph over the first 6 seconds?

b) What is the objects acceleration over the first 2 seconds?

c) What is the objects acceleration at t= 6 seconds?

5. Bruce Lee needs to jump from the roof of a 20m building onto the patio of another building. The patio is 16m above the ground and the buildings are 3.5m apart. Bruce Lee jumps off with only horizontal motion.

a) How long does his jump take?

b) What is his horizontal velocity for this jump?

6. An African Swallow is flying through the sky at a speed of 21m/s. A European Swallow approaches the African in the opposite direction at a speed of 25m/s, but at a distance of 14m below. When should the African Swallow drop its coconut in order to bonk the American Swallow on the head?

Advance Problem

A ball is dropped off a cliff that is 19m high. A second ball is thrown up from the bottom of the cliff with an initial velocity of 15m/s. How much later must the second ball be thrown up at in order to hit the first ball half way up the height of the cliff?