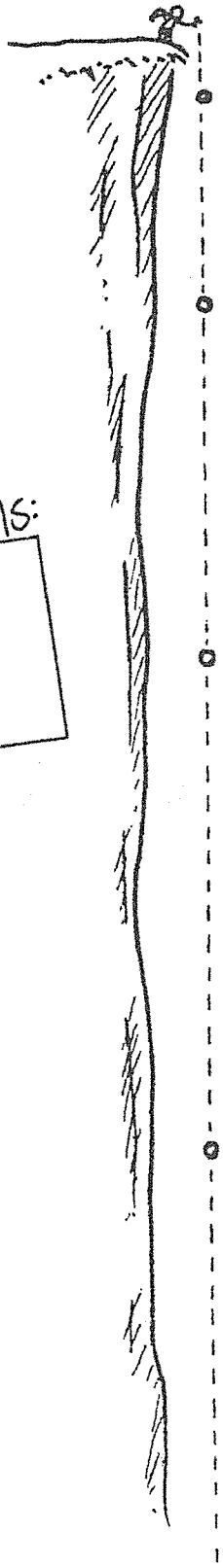
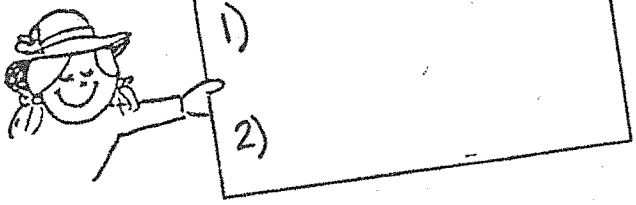
Freefall WS#2

Name:

Free Fall

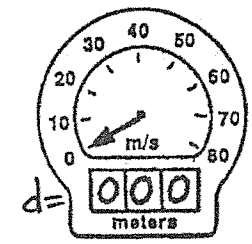
4. A rock dropped from the top of a cliff picks up speed as it falls. Pretend that a speedometer and odometer are attached to the rock to show readings of speed and distance at 1-second intervals. Both speed and distance are zero at time = zero (see sketch). Note that after falling 1 second the speed reading is 9.8 m/s and the distance fallen is 4.9 m. The readings for succeeding seconds of fall are not shown and are left for you to complete. So draw the position of the speedometer pointer and write in the correct odometer reading for each time. Use $a_g = 9.8 \frac{m}{s^2}$ and neglect air resistance.

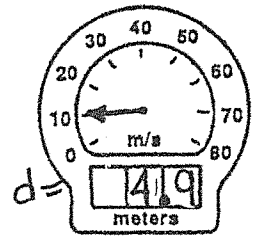


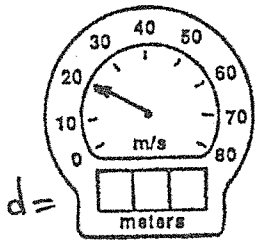


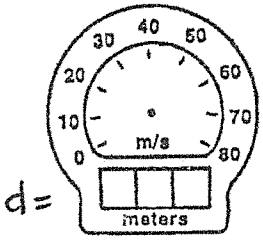
The speedometer reading increases by the same amount, _____ m/s, each second. This increase in speed per second is called _____.

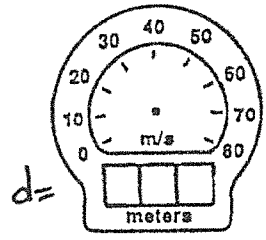
If it takes 7 seconds to reach the ground, then its speed at impact is _____ m/s, the total distance fallen is _____ m, and its acceleration of fall just before impact is _____ m/s^2.

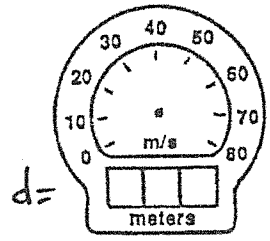


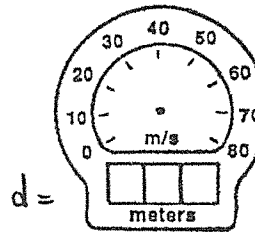










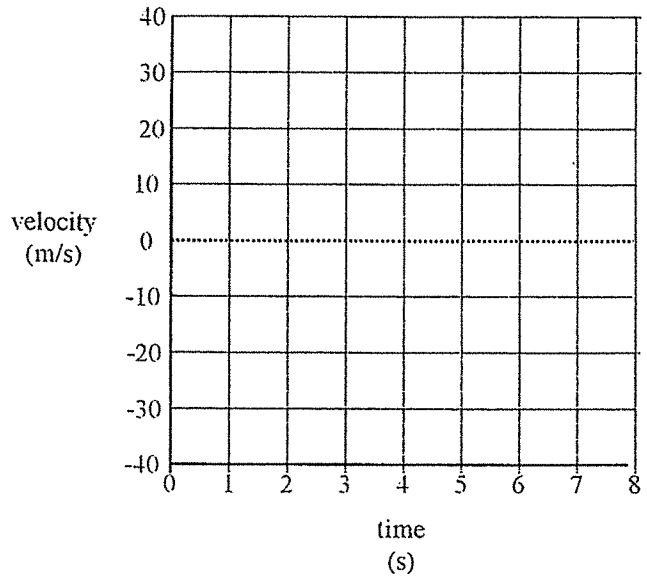


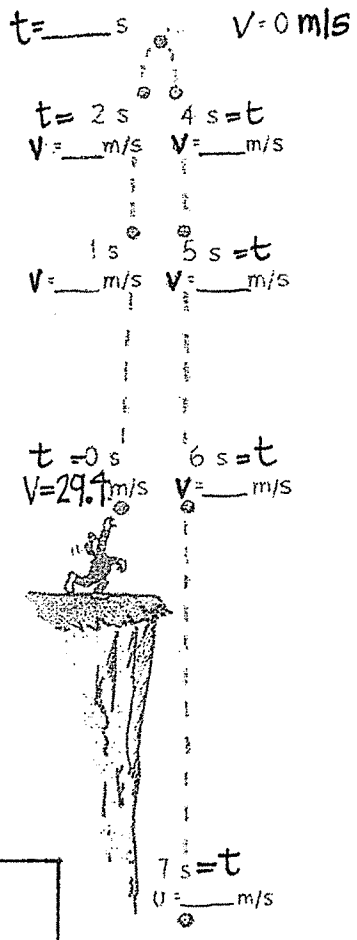
Conceptual PHYSICS

Free-Fall Worksheet

Name: _____

1. A rock is thrown straight upward with an initial velocity of 29.4 m/s as shown in the diagram below.
   a. **On the diagram, label the velocity of the rock at each second.**
   b. Plot its velocity vs. time on the graph below.

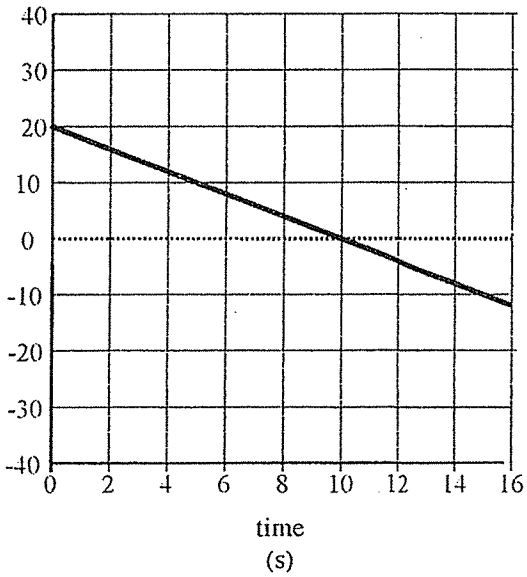




   c. Calculate its displacement after 2 seconds.

d) What maximum height did the ball achieve?

2. A different rock is thrown with an initial upward speed of 20 m/s and the graph shown to the right is obtained.
   a. What is the acceleration of the rock?
   (hint: What is the slope of a v-t graph?)



   b. Is the rock being thrown on Earth? _____
   c. What is the speed of the rock when it reaches its highest point? _____
   d. What is the acceleration of the rock when it is at its highest point? (careful – think slope) _____
   e. What is the displacement of the rock when it reaches its highest point?

how do you know?