Name: _____
Date: _____ Period _____

Acceleration Due to Gravity
Unit 3: Linear Motion Worksheet V

1. A ball is fired up it the air with an initial velocity of 49 m/s, and its velocity and displacement is monitored over a 10 s time interval. Complete the table below, and then use this data to answer the questions that follow: (10pts)

Time Elapsed (s)	**Total Displacement** (m)	**Velocity** (m/s)	**Acceleration** (m/s^2)
0	0	49	–9.8
1			–9.8
2			–9.8
3			–9.8
4			–9.8
5			–9.8
6			–9.8
7			–9.8
8			–9.8
9			–9.8
10			–9.8

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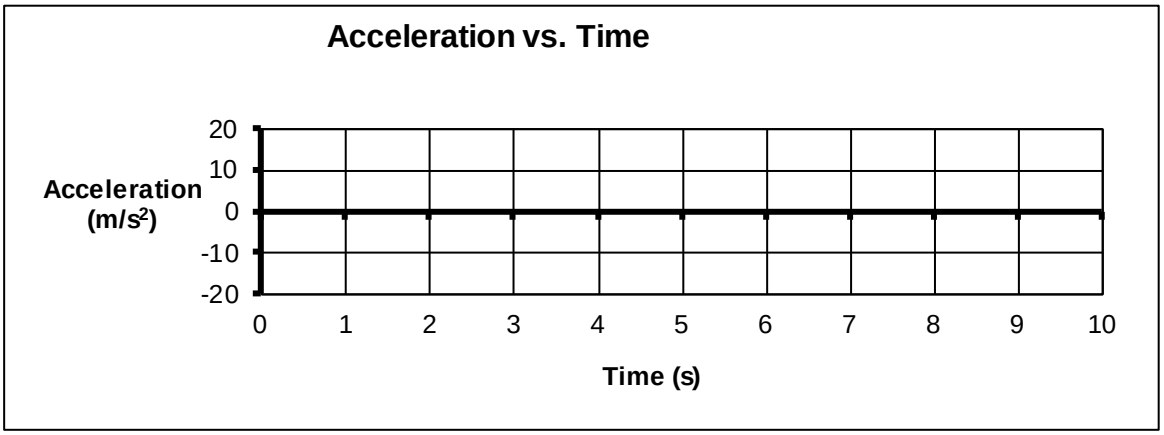
(a) Plot a graph of acceleration vs. time from the previous chart. (3pts)



- What is the shape of the graph? (2pts)

- What is the slope of the graph? (2pts)

- What is the significance of the slope of the graph? (2pts)

- What is the area under the graph? (2pts)

- What is the significance of the area under the graph? (2pts)

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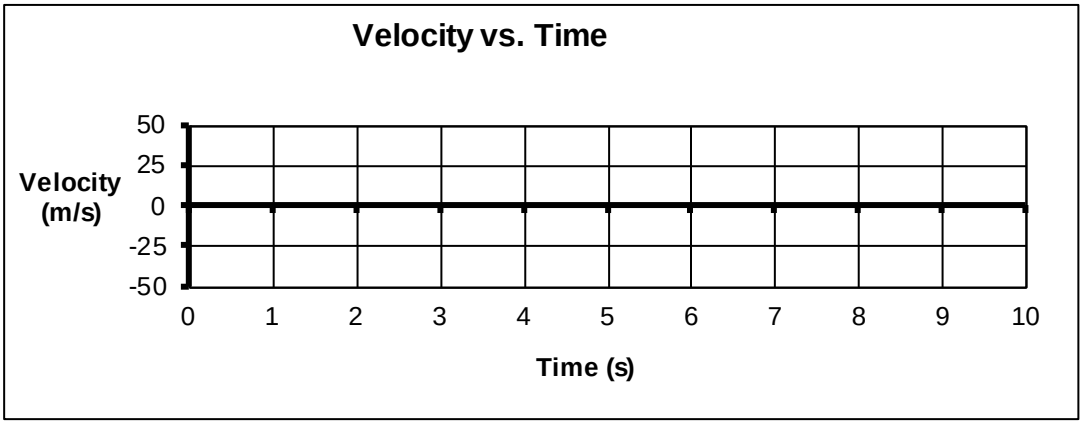
(b) Plot a graph of velocity vs. time from the chart in #1. (3pts)



-What is the shape of the graph? (2pts)

-By examining your graph of acceleration vs. time, how could you have predicted the shape of this graph? (2pts)

-What is the slope of the graph? (2pts)

-What is the significance of the slope of the graph? (2pts)

-What is the area under the graph? (2pts)

-What is the significance of the area under the graph? (2pts)

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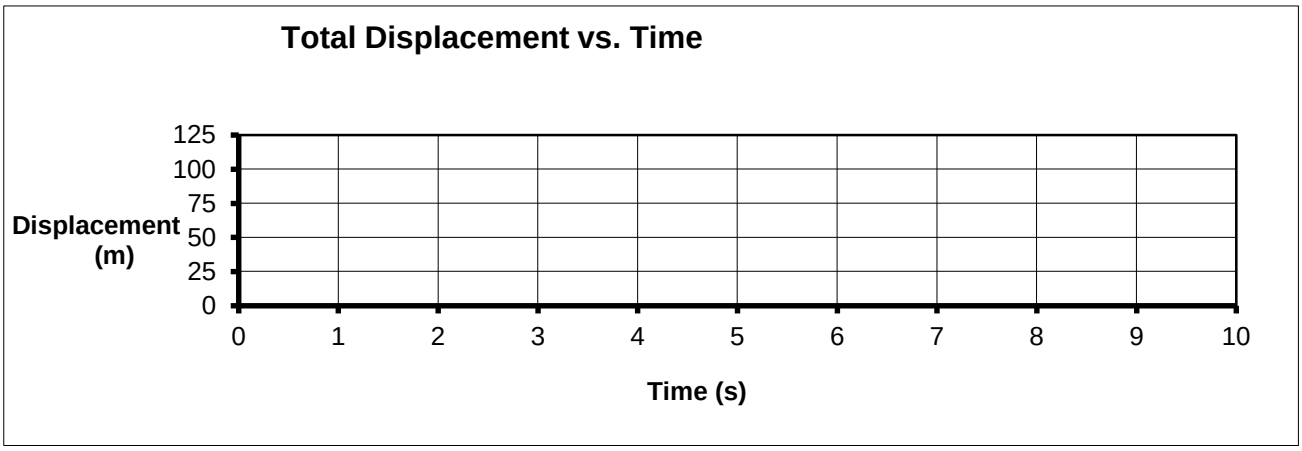
(c) Plot a graph of total displacement vs. time from data in #1. (3pts)



-What is the shape of the graph? (2pts)

-By examining your graph of velocity vs. time, how could you have predicted the shape of this graph? (2pts)

-Find the slope of the graph over the time interval from 0 to 5 s. What is the significance of the slope of the graph in terms of the ball's velocity over that interval? (2pts)

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Acceleration Due to Gravity

Problem:
A ball is thrown up into the air with an initial speed of 20 m/s from the top of a bridge located 30 m above the surface of the river below.

(a) How long will it take the ball to reach the top of its path? (2pts)

(b) Relative to the bridge, how high will the ball rise? (2pts)

(c) From the moment of its release, how long will it take the ball to hit the water? (2pts)

(d) How fast will the ball be moving when it strikes the water? (2pts)