Test 1

Name: _____

How many significant figures are in the number 0003.14?

1. 2
2. 3
3. 4
4. 5

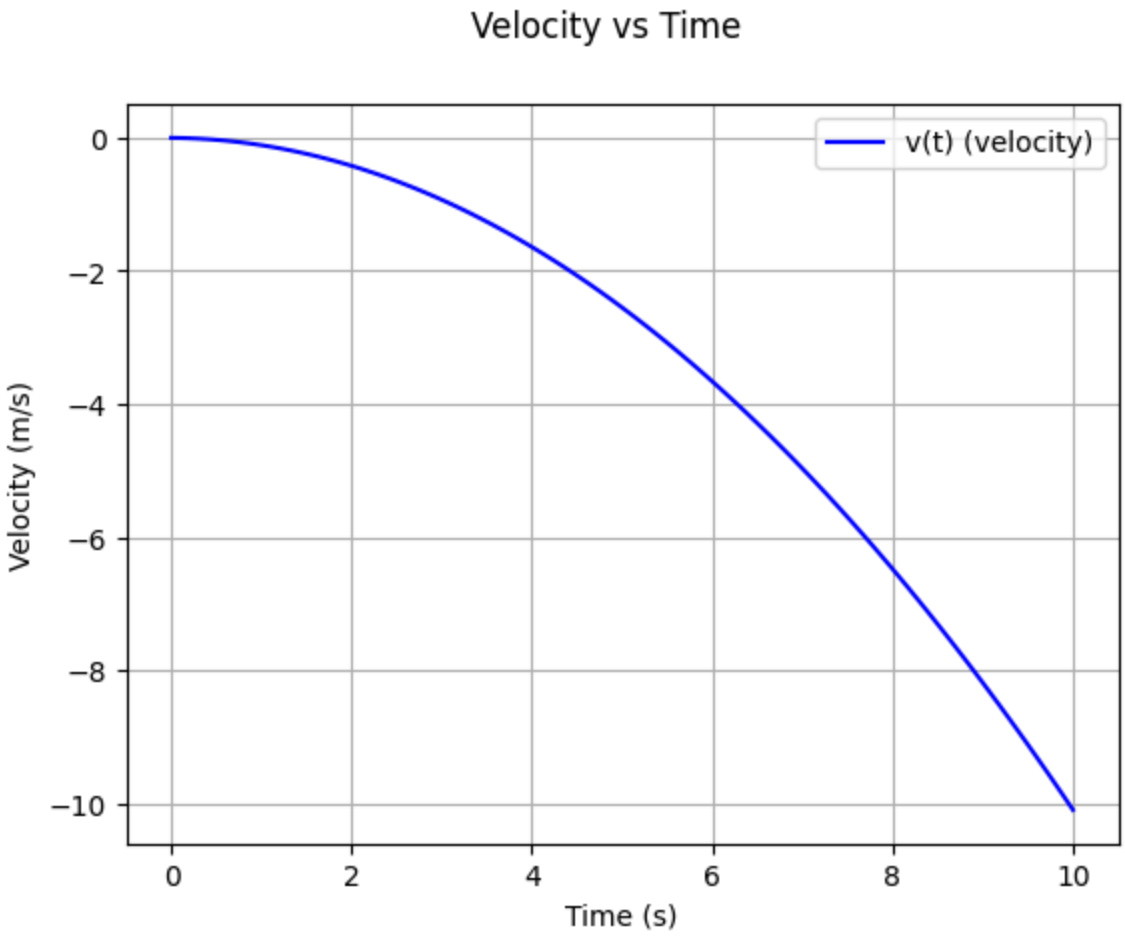
For general projectile motion, which of the following best describes the horizontal and vertical components of a projectile's acceleration? (assume air resistances is negligible):

1. $a_x = 0$, $a_y = -g$
2. $a_x = -g$, $a_y = 0$
3. $a_x = 0$, $a_y = g$
4. $a_x = g$, $a_y = 0$

A red water balloon is thrown horizontally from the top of a bridge. At the same instant, a yellow water balloon is dropped off the bridge from the same height. Compare the time of fall for the two balloons. Assume air resistance is negligible.

1. The red balloon will hit the ground first.
2. The yellow balloon will hit the ground first.
3. Both balloons will hit the ground at the same time.
4. It is impossible to determine without more information.

The figure shows the velocity versus time graph for a car driving on a straight road. Which of the following best describes the acceleration of the car?



Problem #1 (12 Points)

Joseph Fourier tosses a stone of mass of 0.430kg with a speed of $26.8\frac{\text{m}}{\text{s}}$ at an angle of 18.3° degrees above the horizontal towards a wall that is 30.5m away.

Question 1 (3 Points)

Create and draw a well labeled diagram of the situation. Be sure to include all known and unknown quantities.

Question 2 (3 Points)

Resolve the initial velocity into x and y components:

Question 3 (3 Points)

What is the time (t) taken for the stone to hit the wall?

Question 4 (3 Points)

What is the height of the stone when it hits the wall?

Problem #2 (3 Points)

Quinn accelerates at a rate of $2.45\,\frac{\text{blark}}{\text{zoomer}}$.

Extra information

1. $1.00\text{blark} = 0.592\text{yd}$
2. $1.00\text{zoomer} = 1.20\text{h}$

Question 1 (3 Points)

Determine Quinn's acceleration in $\frac{\mathrm{m}}{\mathrm{s}}$.

Problem #3 (6 Points)

Alvin Kamara has a mass of $97.1\mathrm{kg}$ and ran $36.6\mathrm{m}$, accelerating to a speed of $8.02\,\frac{\mathrm{m}}{\mathrm{s}}$.

Question 1 (3 Points)

Determine Alvin's acceleration.

Question 2 (3 Points)

Determine Alvin's time in the $36.6\mathrm{m}$ dash.