

Arts & Science 2D06

Quiz #1 2007 Sept 21

Name:

NB: Mark values are given in brackets [] beside each problem. Write all your answers on the quiz paper. No books or notes allowed. Time to write quiz: 40 minutes.

Solution for quadratic equation: $x = (-b \pm \sqrt{b^2 - 4ac})/2a$

Uniform acceleration: $x = x_0 + v_0t + \frac{1}{2}at^2$ $v^2 = v_0^2 + 2a(x - x_0)$

1. [3] When throwing a ball straight up, which of the following is true about its speed v and acceleration a at the highest point in its path?

- (a) both $v = 0$ and $a = 0$
- (b) $v \neq 0$, but $a = 0$
- (c) $v = 0$, but $a \neq 0$
- (d) both $v \neq 0$ and $a \neq 0$

2. [3] Two people A and B jump and follow different parabolic paths through the air as shown in the figure on the board. Which jumper spends more time in the air before landing? (Ignore air resistance)

- (a) jumper A
- (b) jumper B
- (c) both spend the same time
- (d) need more information

Explain your choice in the space below.

3. [4] A stone is thrown vertically downward from a building 50 m high. If the stone hits the pavement below in 1.8 sec, what was its initial speed?

4. [6] A ball is thrown horizontally from the top of a cliff 20 m high, with an initial velocity of 3.0 m/s.

(a) How far below the starting point will it be in 1.5 seconds?

(b) How long will it take the ball to reach the bottom of the cliff?

(c) How far from the edge of the cliff will it land?

5. [4] A car travels at 20 m/s for 5 seconds. It then speeds up with a constant acceleration of 1.5 m/s^2 for 10 seconds. At the end of this time, what is its velocity?

[20] total marks