**Q1: A nasty teenager is dropping tomatoes from a bridge onto cars on the road below. The height of the bridge (the point from which the tomatoes are dropped) is 10 m above the ground. The teen first sees the cars when they are 50 m away. All cars drive at exactly the speed limit of 40 kilometers per hour. Assume that the tomatoes accelerate downward at 10 m/s2 (this gravitational acceleration is denoted "g" and has an actual experimental value of about 9.8 m/s2 at sea level). How long after a car appears does she need to wait before dropping a tomato to hit the hood of the car at a height of 1.0 m above the ground?**

(A) 4.0 s   (B) 0.8 s   (C) 2.8 s   (D) 3.2 s   (E) 4.5 s

Q2: A rock is thrown with speed V exactly horizontally from the edge of a cliff of height H and hits the ground a distance D away from the base of the cliff. Find the value for D in terms of V, H, and the gravitational acceleration g is given by

(A) $D = v\sqrt{H/g}$ **(B)** $D = v\sqrt{g/2H}$ **(C)** $D = v\sqrt{2H/g}$ **(D)** $D = v\sqrt{H/2g}$

Q3: Consider the three vectors A, B and C shown below

$|\vec{A}| = 1$ $|\vec{B}| = 2$ $|\vec{C}| = 1$
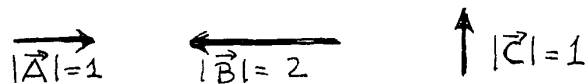
1. The vector **A + B + C** is given by (circle one)

a.   b.   c.   d.   e.

2. The vector **A - C** is given by (circle one)

a.   b.   c.   d.   e.

3. The vector **A - B + C** is given by (circle one)

a.   b.   c.   d.   e.