Flipping Physics Lecture Notes:
AP Physics 1: Kinematics Review Supplement
http://www.flippingphysics.com/ap1-kinematics-review-sup.html

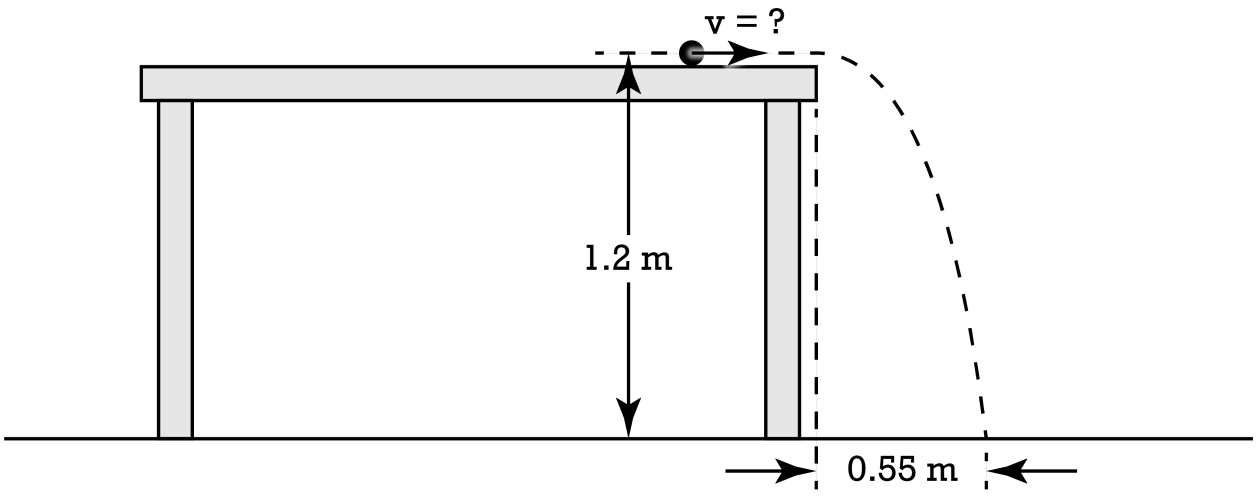
Problems only!!

#1) A projectile is launched with speed v_i at an angle of θ above the horizontal. At its maximum height, the horizontal and vertical components of its velocity and acceleration are:

	Horizontal Velocity Component	Vertical Velocity Component	Horizontal Acceleration Component	Vertical Acceleration Component
(A)	$v_i \cos(\theta)$	0	0	-g
(B)	$v_i \sin(\theta)$	$v_i \cos(\theta)$	0	-g
(C)	$v_i \cos(\theta)$	$v_i \sin(\theta)$	-g	0
(D)	$v_i \sin(\theta)$	0	-g	0

#2) A small steel ball rolls off a horizontal table with a height of 1.2 m and lands a horizontal distance of 0.55 m from the edge of the table. What was the speed of the ball as it rolled on the table? (Friction is negligible)

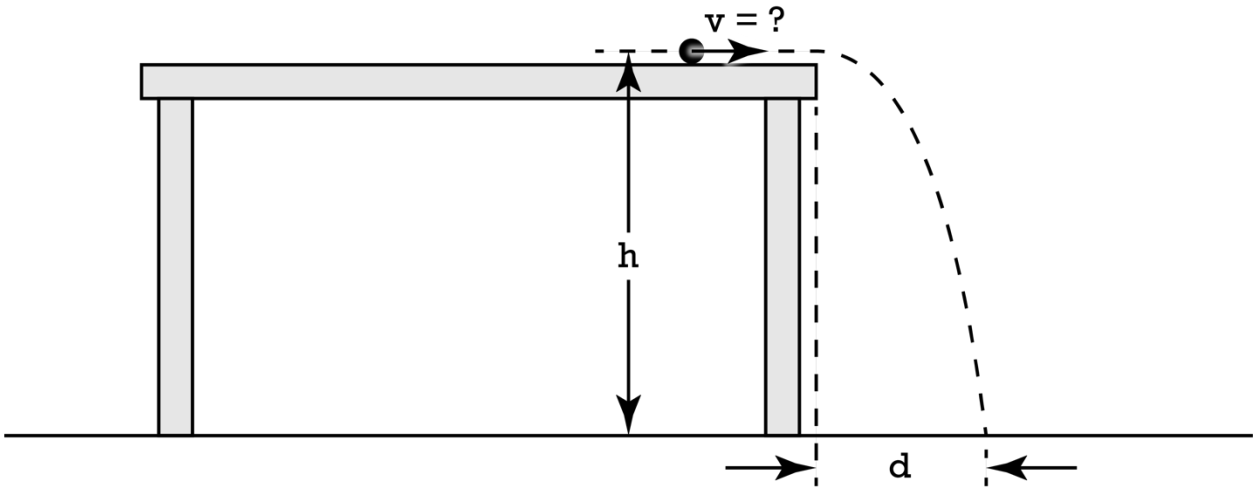
(A) 0.27 m/s (B) 0.49 m/s (C) 0.89 m/s (D) 1.1 m/s



It is also plausible they would ask you questions like this without numbers. That would look like this:

#2a) A small steel ball rolls off a horizontal table with a height of h and lands a horizontal distance of d from the edge of the table. What was the speed of the ball as it rolled on the table? (Friction is negligible)

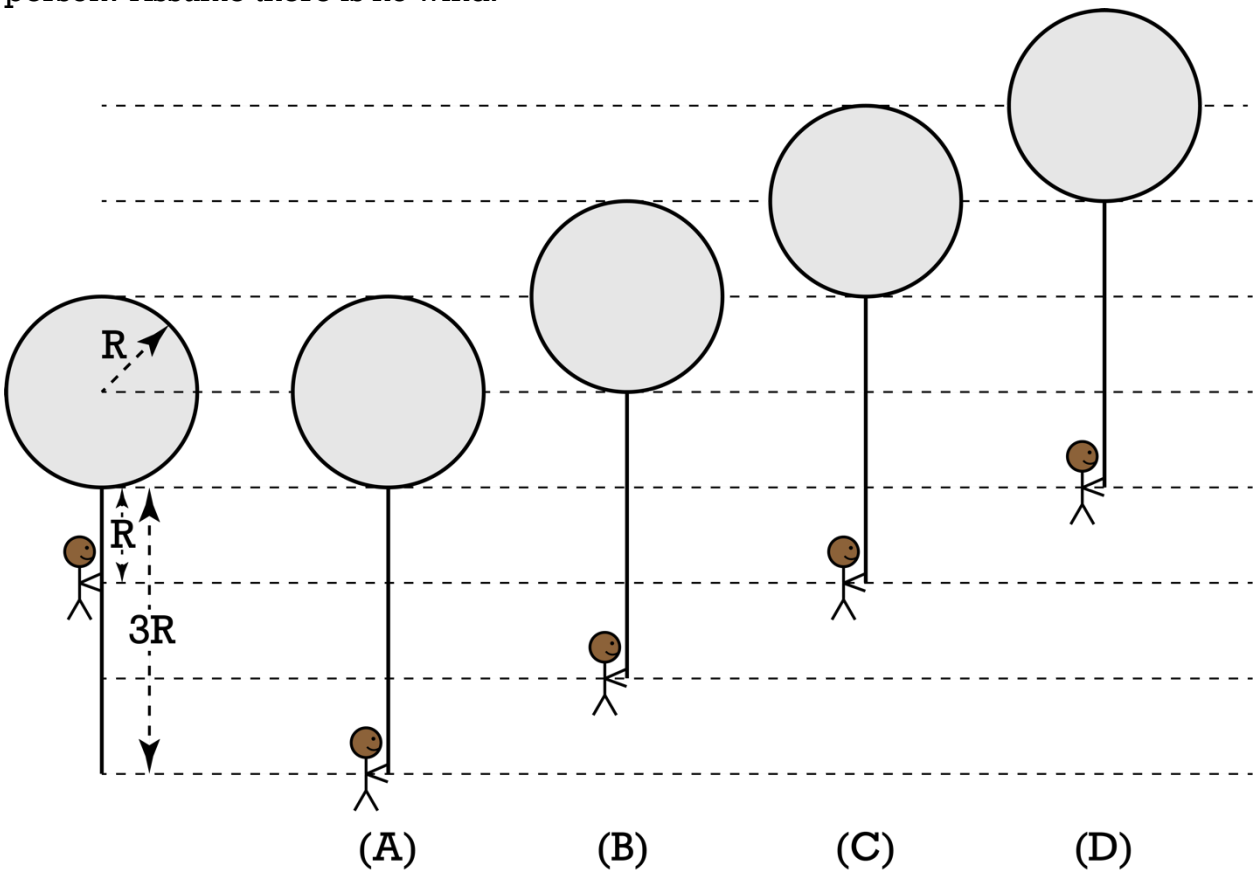
(A) $\sqrt{\frac{2d^2h}{g}}$ (B) $v = \sqrt{\frac{2h}{g}}$ (C) $\sqrt{\frac{2h}{d^2g}}$ (D) $\sqrt{\frac{d^2g}{2h}}$



#3) Rain falls vertically straight down with respect to the Earth at a speed of 8.0 m/s. A passenger in a car moving at a horizontal constant speed observes the rain to be falling at an angle of 55° with respect to the vertical. What is the speed of the car?

(A) 4.6 m/s (B) 5.6 m/s (C) 6.5 m/s (D) 11 m/s

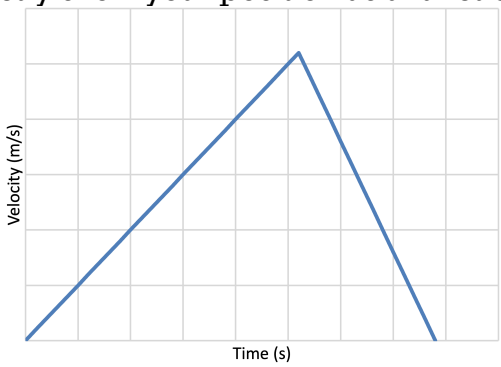
#4) A giant, spherical helium balloon with mass M and radius R has a massless rope of length 3R hanging from it. A person with a mass of M is hanging on the rope in perfect equilibrium such that the balloon-person system does not move up or down. If the person starts a distance R from the bottom of the balloon and climbs down to the end of the rope, which figure best illustrates the final position of the balloon and person? Assume there is no wind.

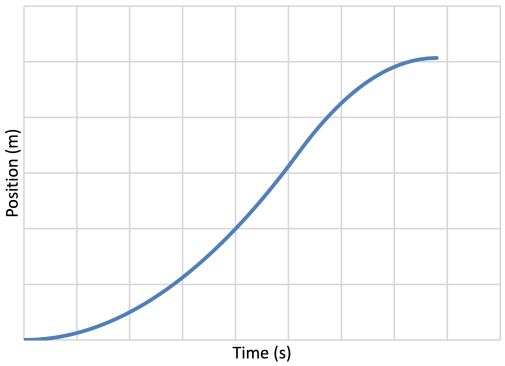


5) While peacefully reading your physics textbook, you are sliding at 3 m/s East on a very large patch of frozen, frictionless ice. In frustration, you decided to throw your physics textbook and give it a speed of 8 m/s North. If your mass is 40 times larger than the mass of your physics textbook, what is the velocity of the center of mass of the you-textbook system after you throw the book?

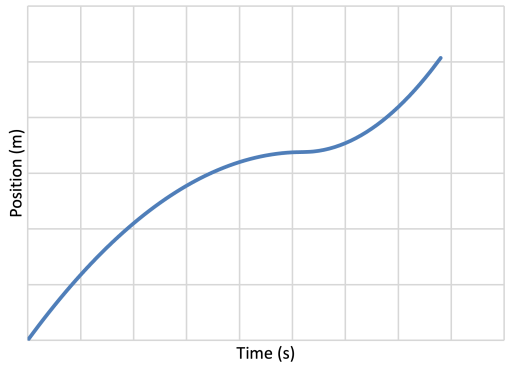
(A) 0
(B) 3 m/s East
(C) 4 m/s @ 53° South of East
(D) 4 m/s @ 37° South of East

6) You slam down on the accelerator pedal in your car causing it to speed up with a uniform acceleration. After a few seconds, you take your foot off the accelerator pedal and immediately slam it down on the brake pedal, causing your car to slow down with a uniform acceleration. Your velocity as a function of time graph is shown. Which graph could correctly show your position as a function of time?

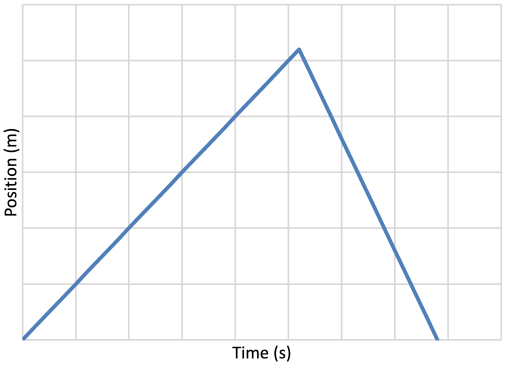




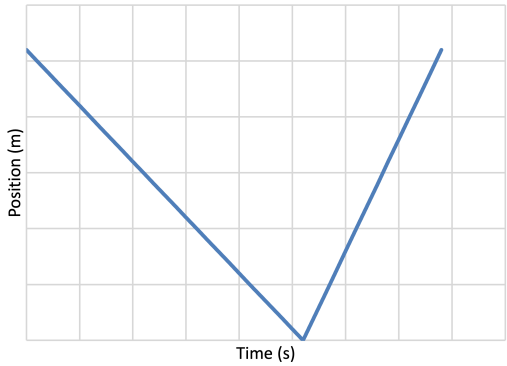
(A)



(B)

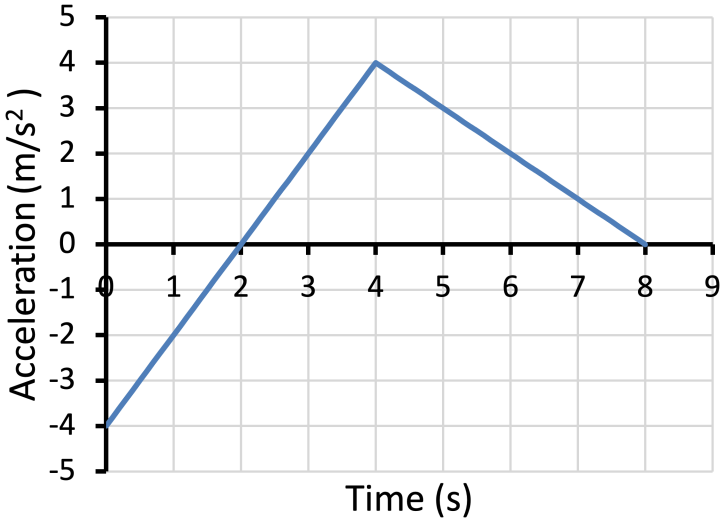


(C)



(D)

7) The graph shows the acceleration of a particle with respect to time. Assuming the velocity of the particle at t = 0 seconds is -10 m/s, which of the following is the velocity of the particle at t = 6 seconds?



(A) -2 m/s
(B) 0 m/s
(C) 6 m/s
(D) 10 m/s