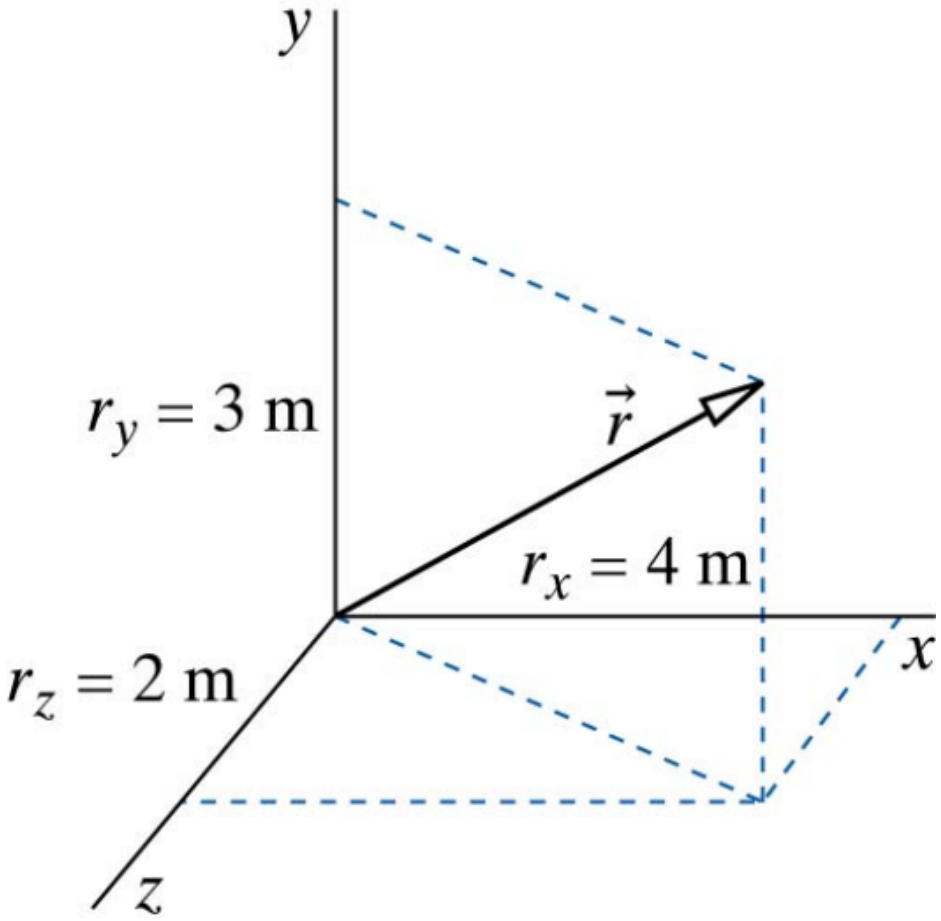
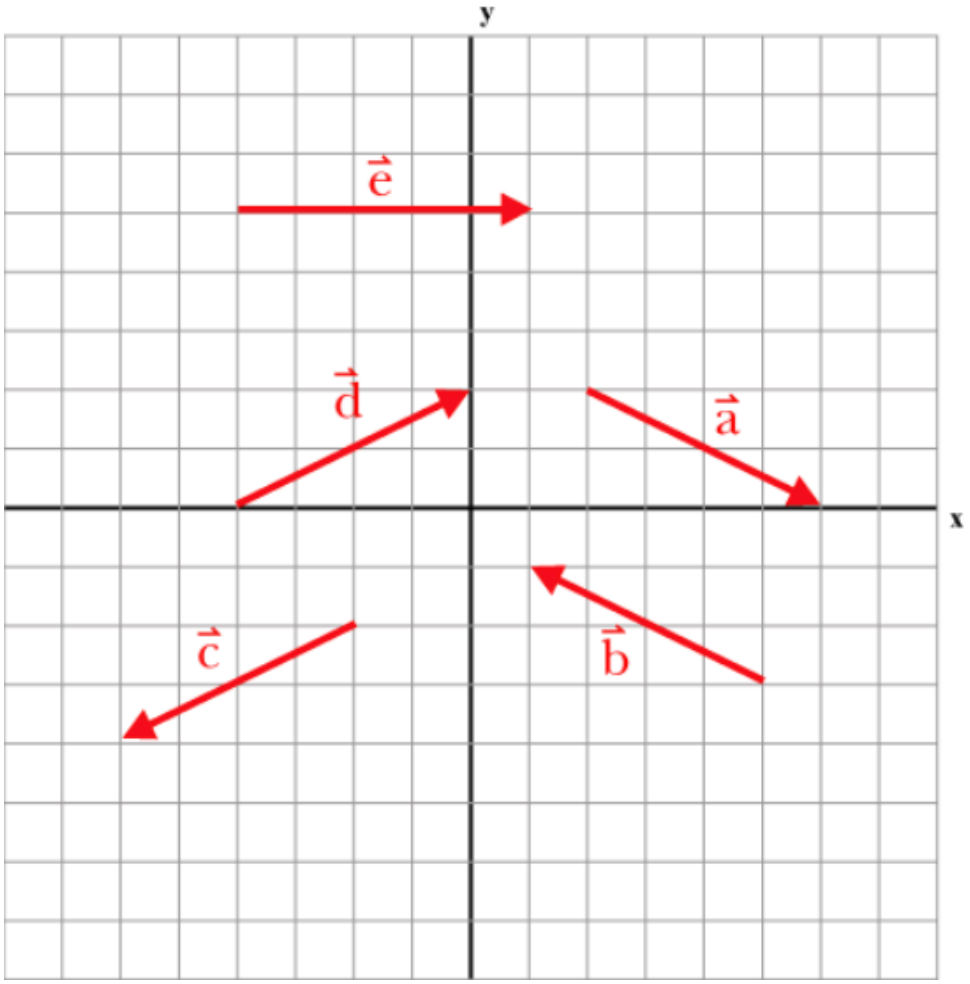
Reminders

- First homework is due Sunday at 8pm
- First exam is Monday in class
  - Bring a pencil or pen (blue or black) and a calculator
  - No notes, books, etc.
- "Office Hours" start this week (BPS 1248)
  - UTA schedule on LON-CAPA
  - DC Fridays 3pm-5pm
- There will not be an honors option for this section

Defining a vector

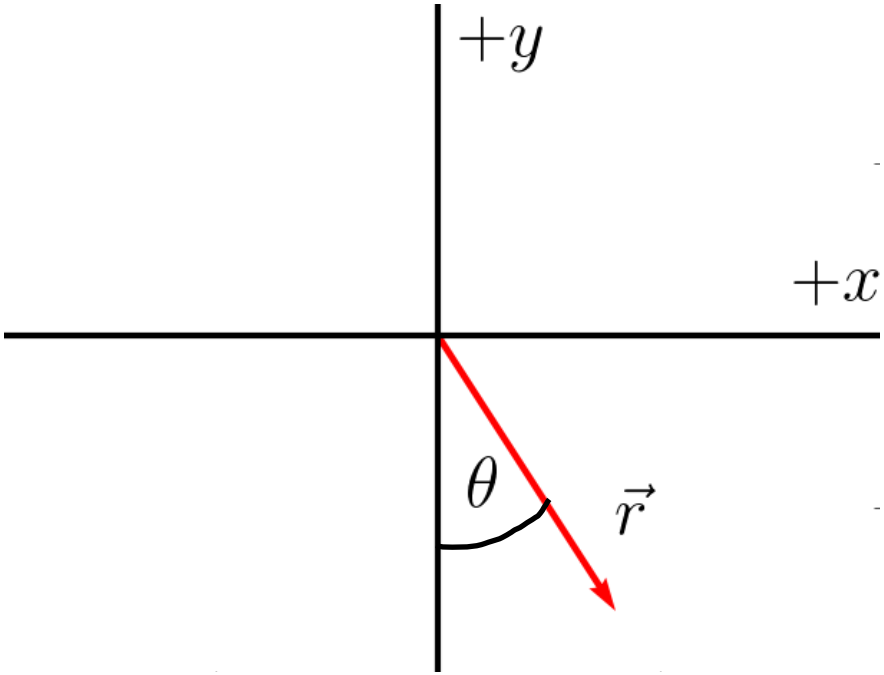


1-2) Which of these arrows represents the vector $\langle -4, 2, 0 \rangle$?



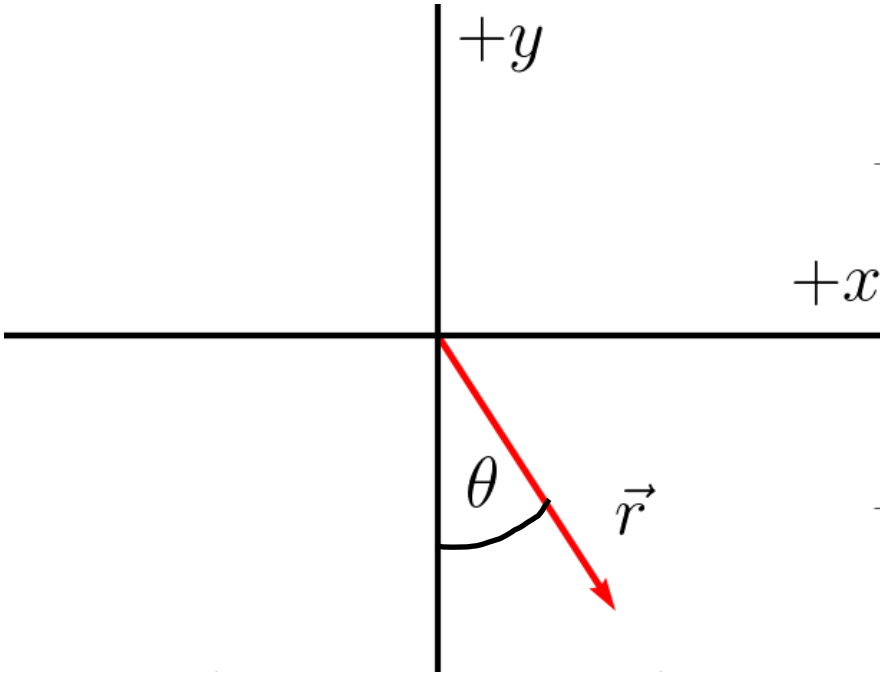
Remember to set clicker frequency to BB.

1-3) For the vector given below, which is the correct description of r_x?



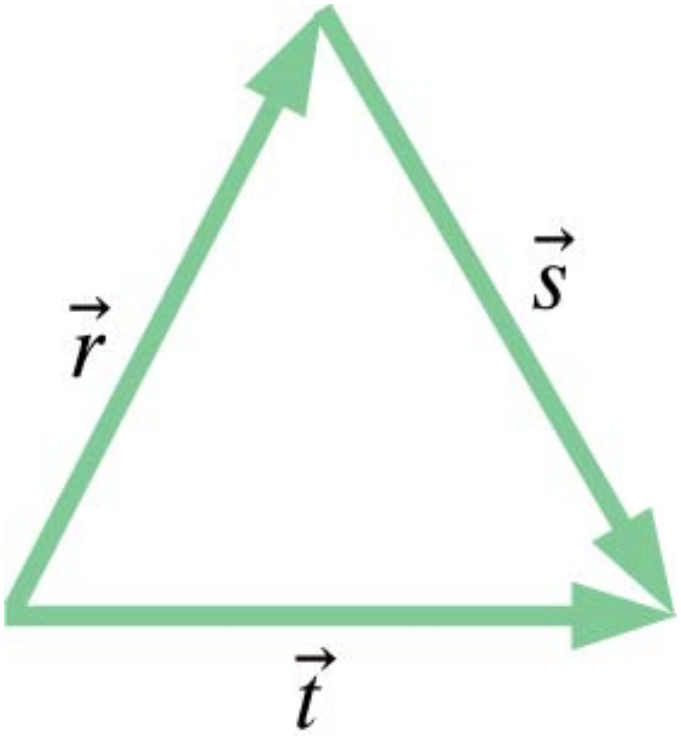
A. r cos(θ)
B. r sin(θ)
C. -r cos(θ)
D. -r sin(θ)
E. Something else

1-4) For the vector given below, which is the correct description of r_y?



A. r cos(θ)
B. r sin(θ)
C. -r cos(θ)
D. -r sin(θ)
E. Something else

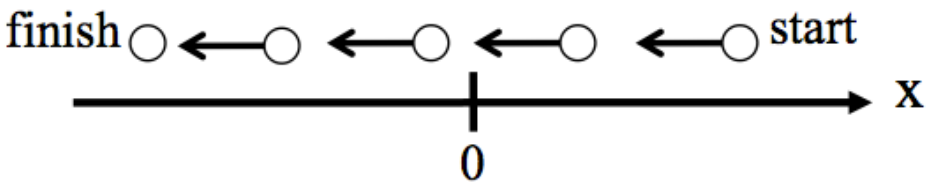
1-5) Which of the following statements about the three vectors shown are correct?



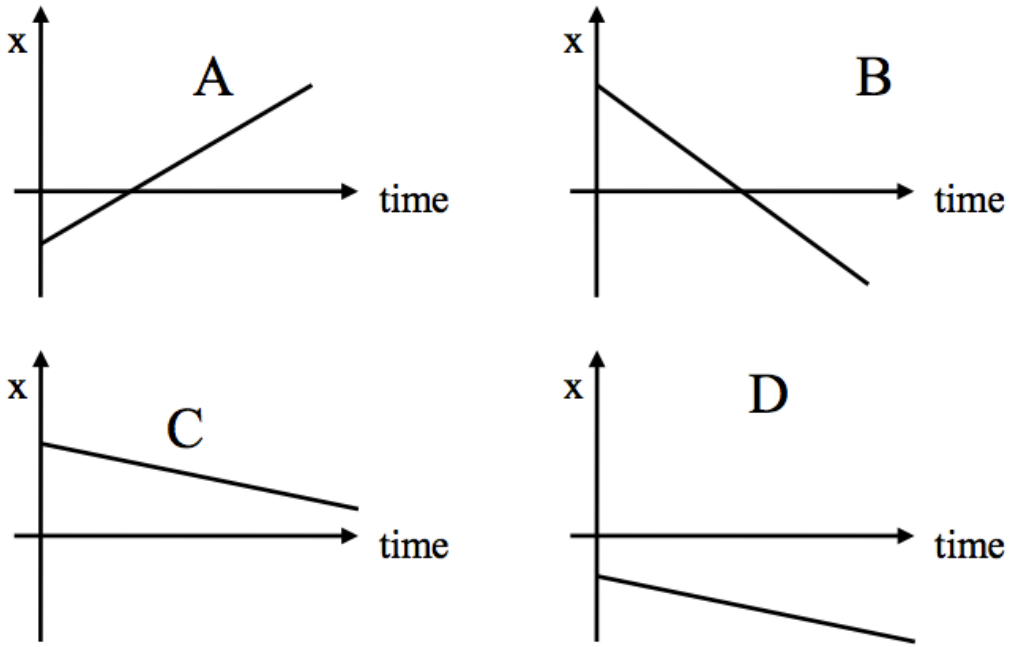
A. $\vec{s} = \vec{t} + \vec{r}$
B. $\vec{r} = \vec{t} - \vec{s}$
C. $\vec{r} = \vec{t} + \vec{s}$
D. $\vec{t} = \vec{r} - \vec{s}$
E. Something else

Motion in 1D

2-1) An object starts at x=+5 and moves left along the x-axis at constant speed:

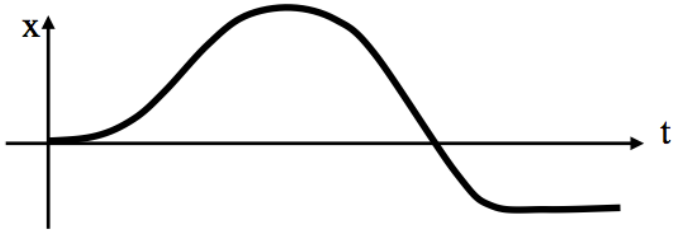


Which graph represents this motion?

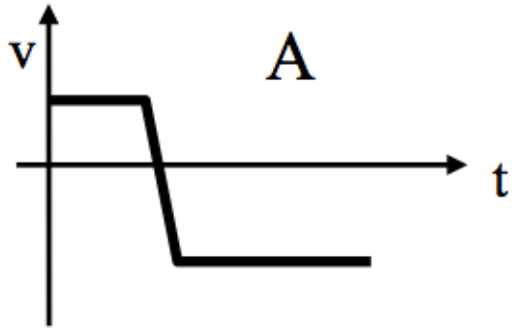


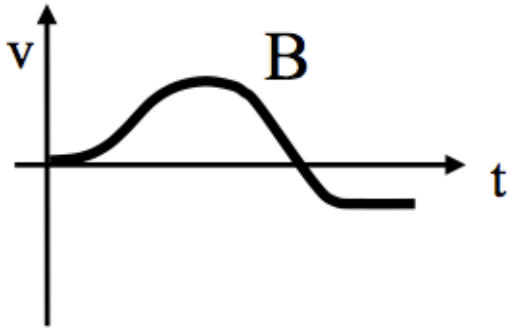
E: None of these!

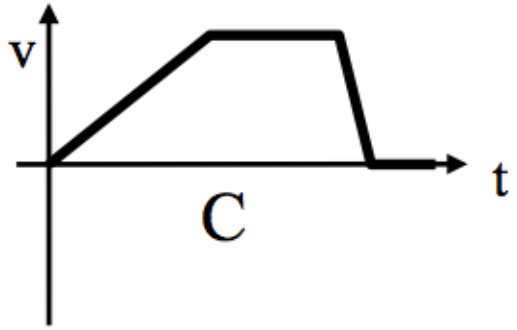
2-2) A train moves along a straight track and its position vs time looks like:

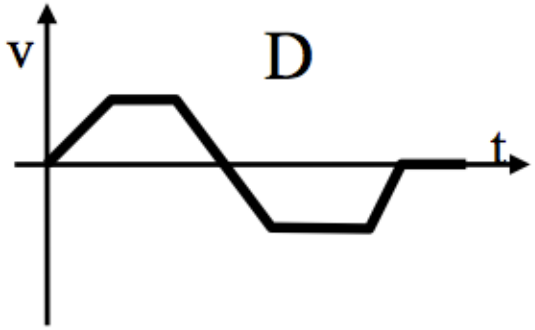


Which graph best depicts the train's <u>velocity</u> versus time?

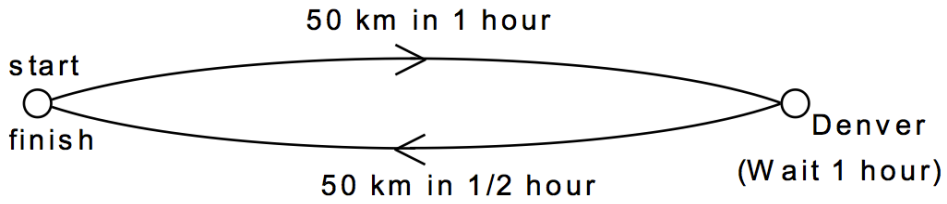








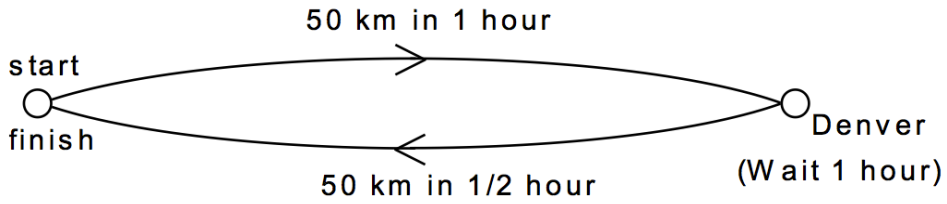
2-3a) A person starts in Boulder, drives to Denver, 50 km away, in 1 hour, stays in Denver for 1 hour, then speeds back to Boulder in 30 minutes.



What is the average speed of this round trip?

A) Zero
B) 67 km/hr
C) 40 km/hr
D) 75 km/hr
E) None of these.

2-3b) A person starts in Boulder, drives to Denver, 50 km away, in 1 hour, stays in Denver for 1 hour, then speeds back to Boulder in 30 minutes.



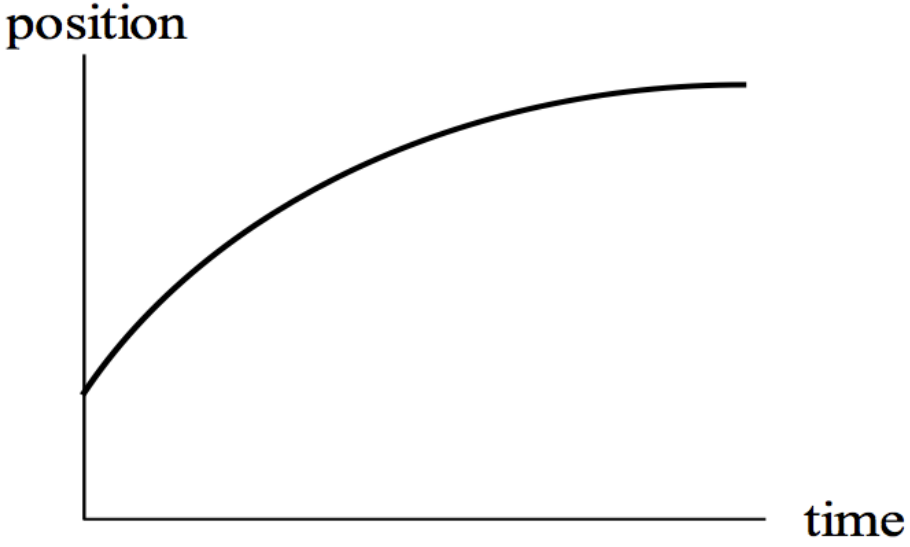
What is the average **velocity** of this round trip?

A. Zero
B. 67 km/hr
C. 40 km/hr
D. 75 km/hr
E. None of these.

Reminders

- LearnSmart access codes are posted on LON-CAPA
- 1st Exam on Monday
  - Seating chart coming soon

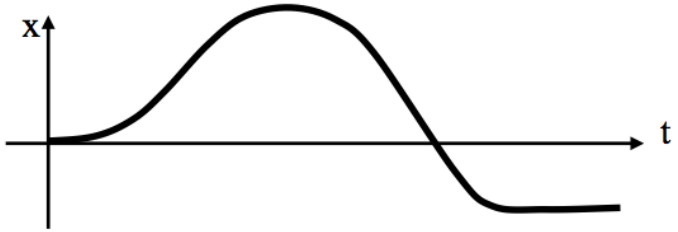
2-4) A train car moves along a long straight track. The graph shows the position as a function of time for the train.



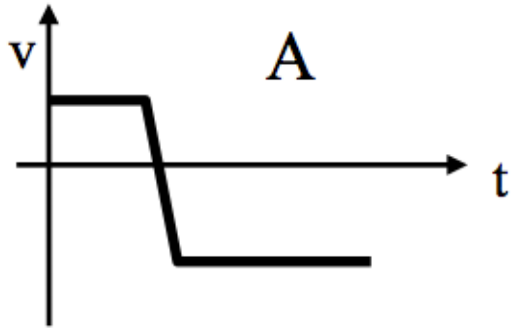
The graph shows that the train:

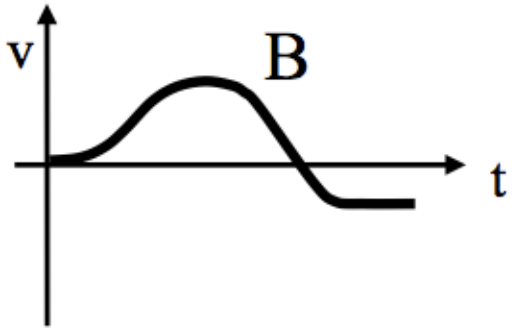
A. speeds up all the time.
B. slows down all the time.
C. speeds up part of the time and slows down part of the time.
D. moves at constant velocity.
E. none of these statements is true.

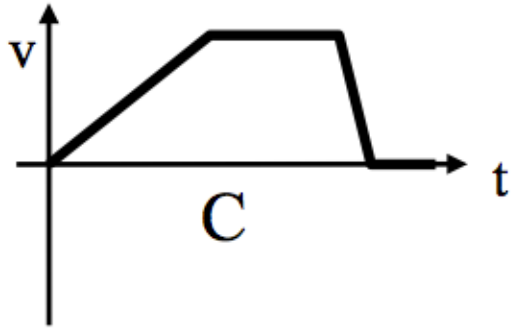
2-2) A train moves along a straight track and its position vs time looks like:

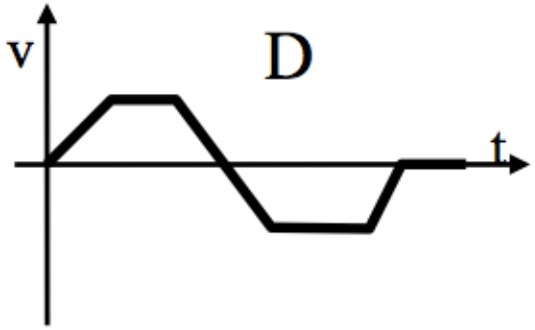


Which graph best depicts the train's <u>velocity</u> versus time?

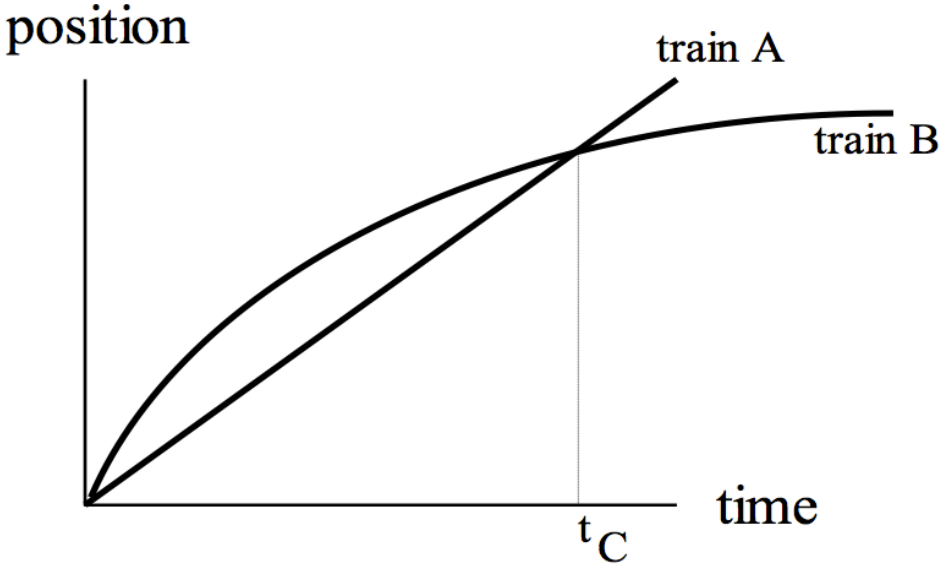








2-5) The graph shows positions as a function of time for two trains running on parallel tracks. Which statement is true?



A. At time t_C, both trains have the same velocity.
B. Both trains speed up all the time.
C. Both trains have the same velocity at some time before t_C.
D. At some time, both trains have the same acceleration
E. None of the above statements is true.

2-6) The position of some object as a function of time is given by the expression:

$$x(t) = a + b\,t + c\,t^2$$

Which is the correct expression for the velocity?

A. $v(t) = 2\,c$

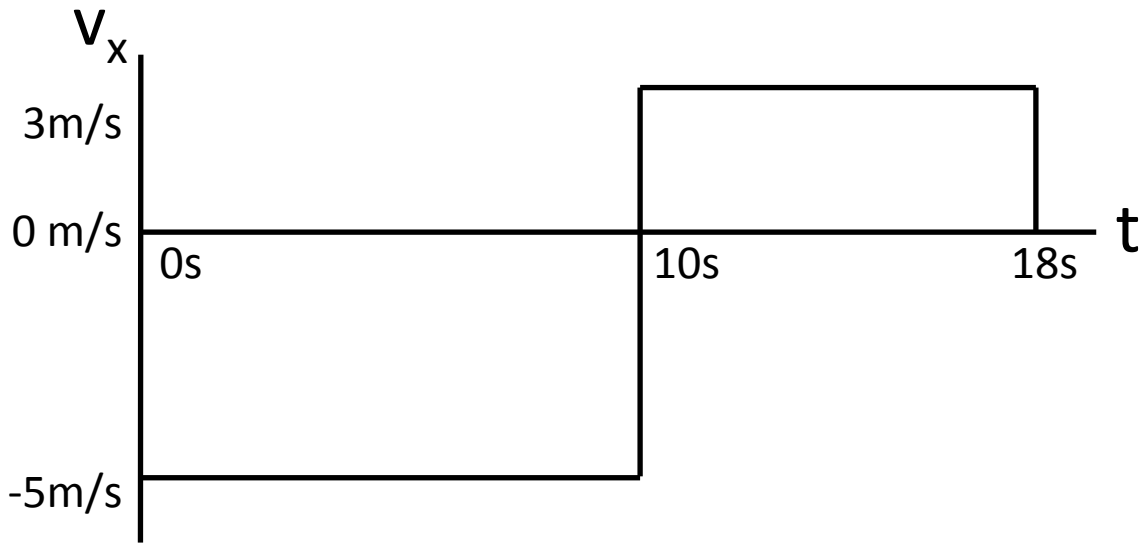
B. $v(t) = 2\,c\,t$

C. $v(t) = b + c\,t$

D. $v(t) = b\,t + c\,t^2$

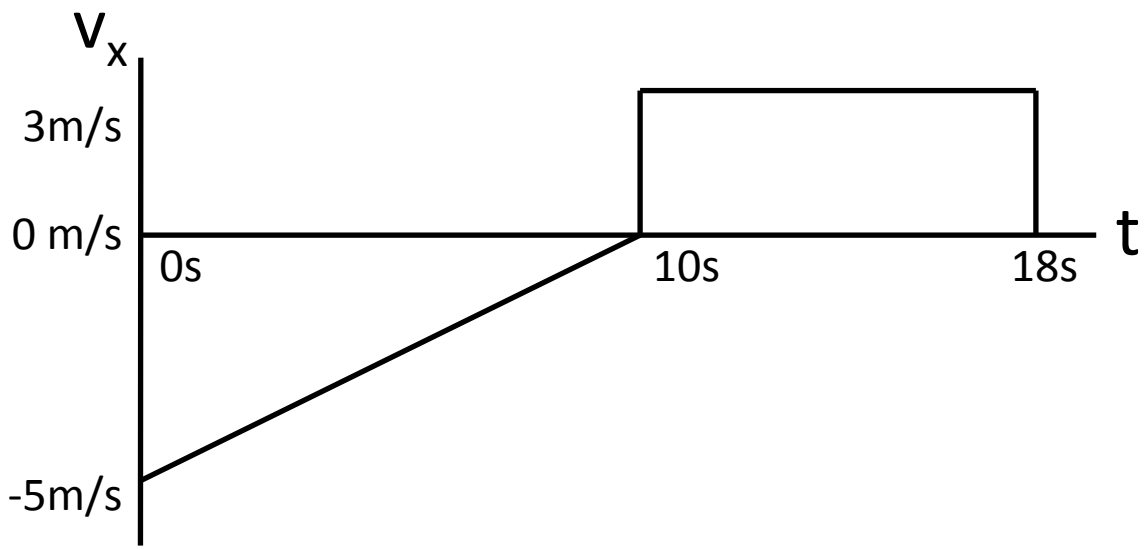
E. Something else

2-6b) Consider this velocity versus time graph? What's the displacement between t=0s and t=18s?



A. +74 m
B. +26 m
C. -26 m
D. -74 m
E. Something else

2-6c) Consider this velocity versus time graph? Did the object <u>overall</u> move to the left or right?



A. Moved to the right
B. Moved to the left

Reminders

- First exam is Monday in class
  - Bring a pencil or pen (blue or black) and a calculator
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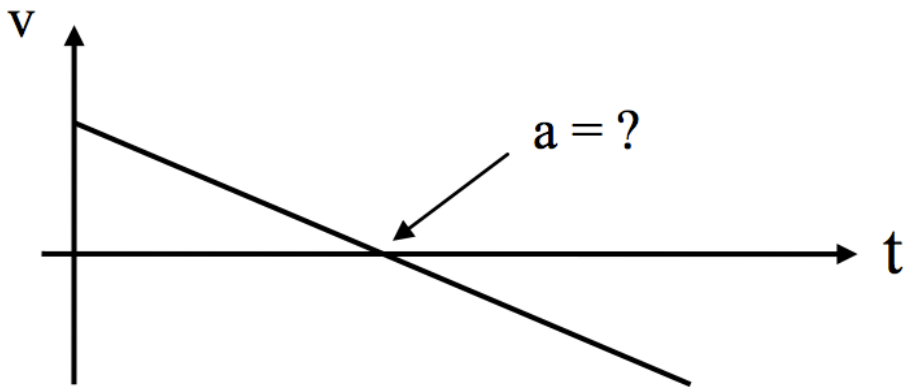
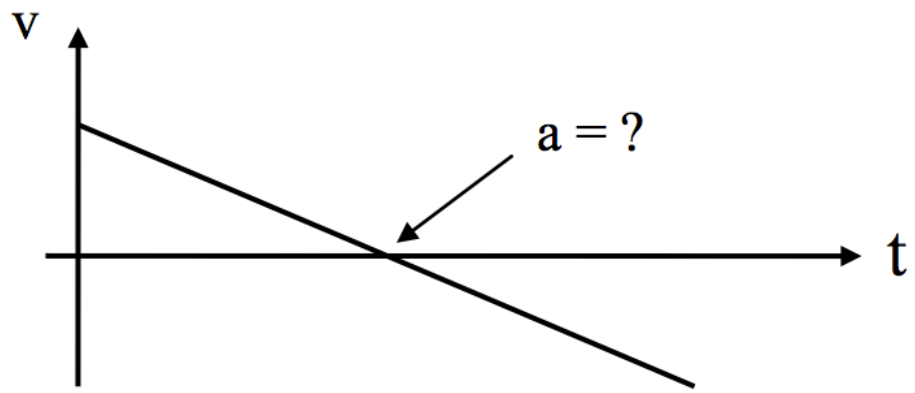
  - Seating chart posted
- "Office Hours" (BPS 1248)
  - UTA schedule on LON-CAPA
  - DC Fridays 3pm-5pm
- LearnSmart is working?

2-7a) At the moment that the velocity is zero, what is the sign of the acceleration?



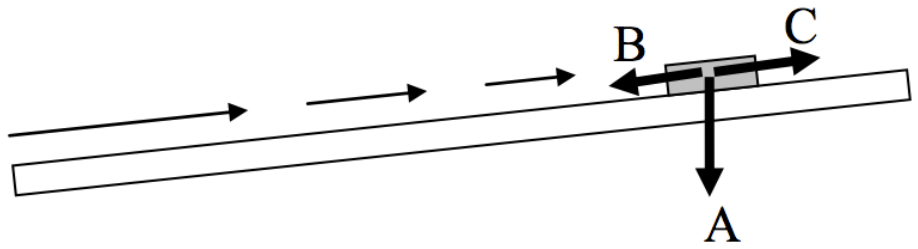
A. Positive
B. Negative
C. Zero

2-7b) Is the acceleration constant all during the time the velocity is changing?



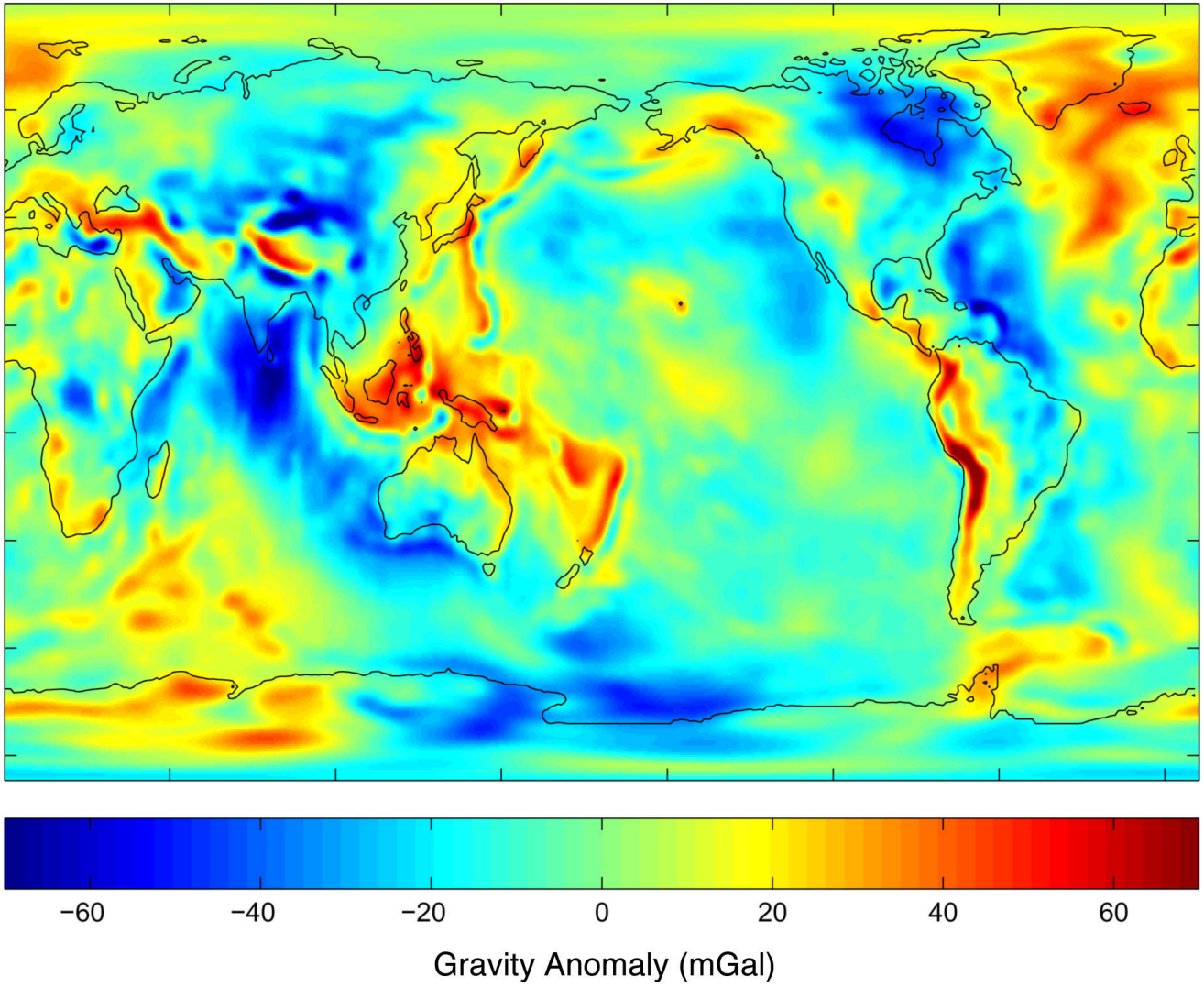
A. Yes, a = constant
B. No, a is changing

2-8) A glider on a tilted air track is given a brief push uphill. The glider coasts up to near the top end, stops, and then slides back down. When the glider is at the highest point of its path, its acceleration is…



A. straight down.
B. downward along the track.
C. upward along the track.
D. no direction, acceleration is zero.

Free-fall in 1D



Going to the moon?

Bring a feather!

http://www.youtube.com/watch?v=5C5_dOEyAfk&t=0m36s

2-9) A ball is thrown straight upward. NO air resistance. At the top of its trajectory, its acceleration is…

A. zero.
B. straight up.
C. straight down.
D. depends on the mass of the ball.

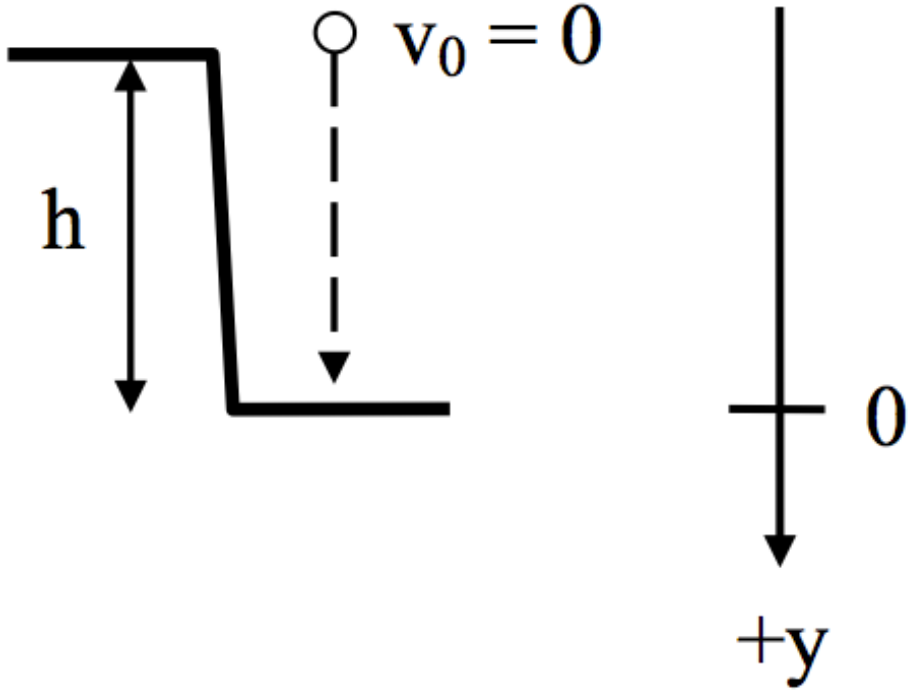
2-10) If you drop an object in the absence of air resistance, it accelerates downward at 9.8 m/s^2. Instead if you throw it downward, its downward acceleration after release is…

A. less than 9.8 m/s^2
B. 9.8 m/s^2
C. more then 9.8 m/s^2

2-11) A rock is dropped from rest and falls a distance h (h > 0) to the ground. Down is chosen as the positive direction and the origin is placed at ground level.

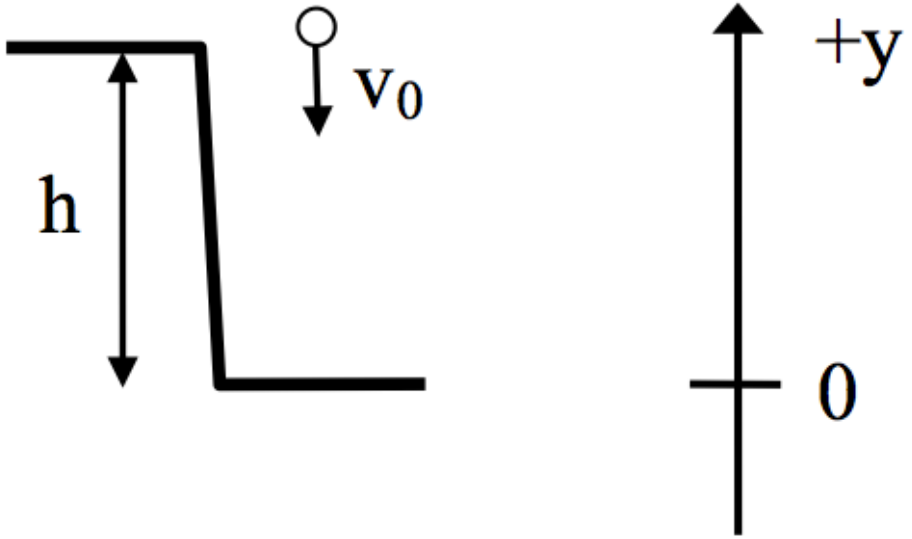
What is y_0 (the initial position) and what is a (the acceleration)?

A. $y_0 = +h$, $a = -g$
B. $y_0 = -h$, $a = +g$
C. $y_0 = 0$, $a = +g$
D. $y_0 = -h$, $a = -g$
E. $y_0 = 0$, $a = -g$



2-12) A rock is thrown straight down from an initial height h above the ground, with an initial velocity v_0. UP is chosen as the positive direction. Which is the correct formula for the velocity in this case?

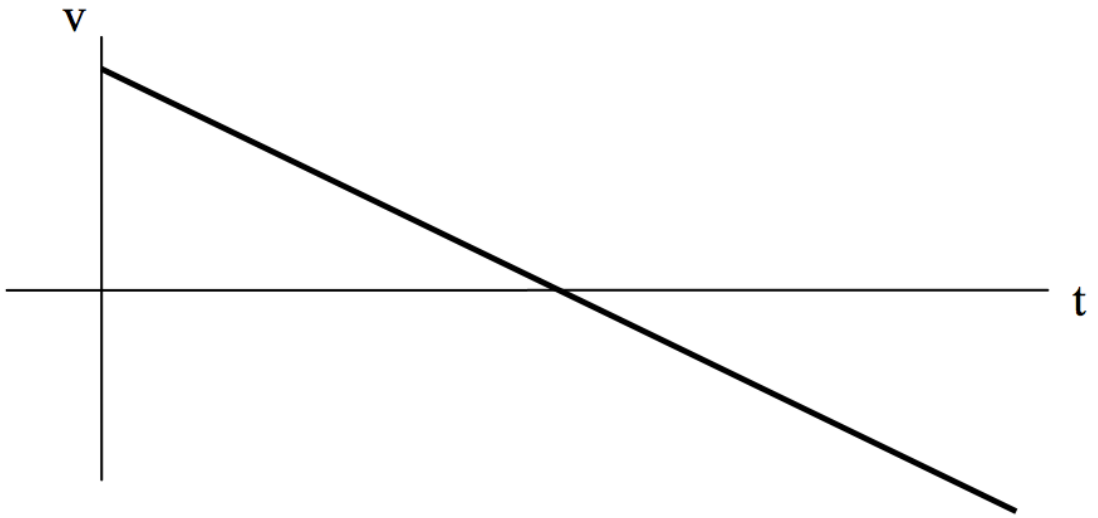
A. $v = v_0 + gt$
B. $v = v_0 - gt$
C. $v = -v_0 - gt$
D. $v = -v_0 + gt$
E. Something else



2-13) A rock is thrown downward with an initial speed $|v_0|$ from the edge of a cliff. Assume no air resistance. It falls straight down and strikes the ground after falling a distance h. A student is asked to compute the final speed of the rock, just before it hits the ground. Which formula should she use?

A. $v = v_0 + a\,t$
B. $x = x_0 + v_0\,t + (1/2)\,a\,t^2$
C. $v^2 = v_0^2 + 2a(x-x_0)$
D. None of these will work.
E. More than one of these will work OK.

2-14) An object's velocity vs. time graph looks like this:



Which situation produces this kind of motion?

A. A rock is thrown straight up.
B. A rock is dropped from rest.
C. A rock is thrown straight down.
D. A book slides along a table and comes to rest.
E. None of these.

2-15) A ball is fired from a cannon straight upward with an initial velocity v_0. Assume no air resistance. To compute the time to reach the top (apex), which **<u>one</u>** formula should be used?

A. $v = v_0 + a\,t$
B. $x = x_0 + v_0\,t + (1/2)\,a\,t^2$
C. $v^2 = v_0^2 + 2a(x-x_0)$
D. None of these will work.
E. More than one of these will work OK.

2-16) If the initial velocity v_0 is doubled, the time to reach the apex of the trajectory…

A. doubles.
B. increases by a factor of 4.
C. Neither of these.
D. Impossible to tell from the information given.

2-17) To compute the maximum height, which **<u>one</u>** formula should be used?

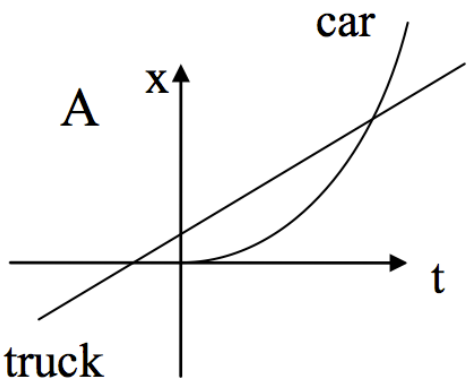
A. $v = v_0 + a\,t$
B. $x = x_0 + v_0\,t + (1/2)\,a\,t^2$
C. $v^2 = v_0^2 + 2a(x-x_0)$
D. None of these will work.
E. More than one of these will work OK.

2-18) If the initial velocity v_0 is doubled, the maximum height of the ball…

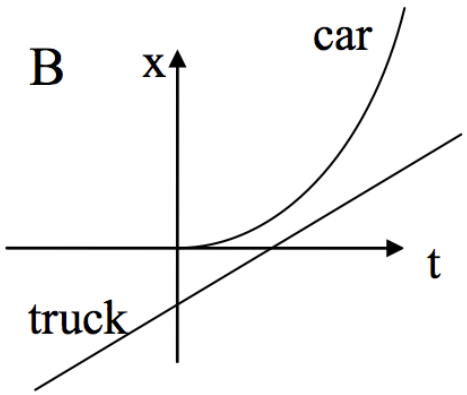
A. doubles.
B. increases by a factor of 4.
C. Neither of these.
D. Impossible to tell from the information given.

2-19) A truck traveling at 50 km/hr approaches a car stopped at a red light. When the truck is 100 m form the back of that car, the light turns green and the car immediately begins to accelerate at 2.00m/s^2. Which graph below represents this situation?

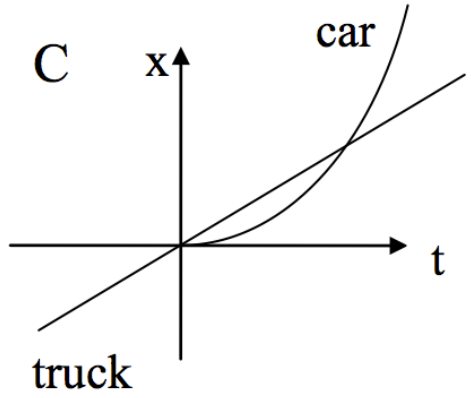
A



B



C



D) None of these