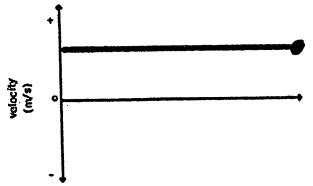
Velocity Time Packet

Velocity vs. Time Graphs

I) Type of Motion	II) V-T sketch
1)_____	
2)_____	
3)_____	
4)_____	
5)_____	
6)_____	
7)_____	

How would you walk to create each of the following Velocity Time graphs?

1)



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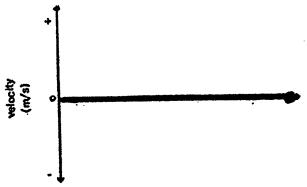

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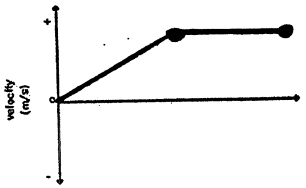

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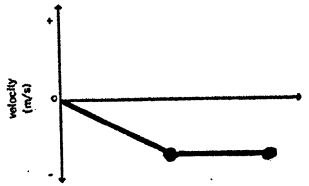

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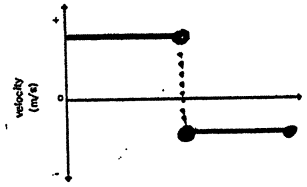

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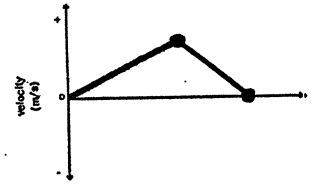
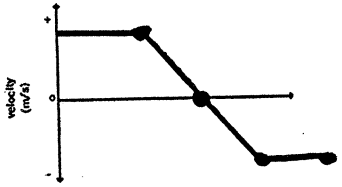
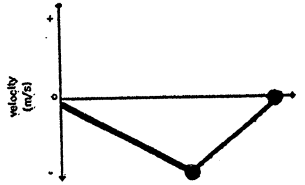


7)

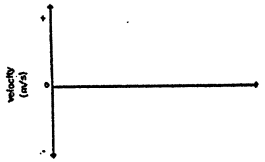


8)

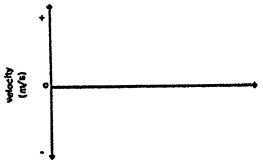


Sketch what Velocity-Time graph would result from each situation.

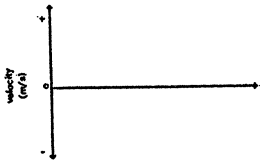
1) Walking away from the origin at a constant velocity.



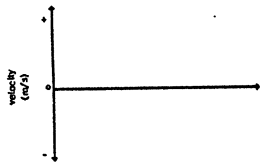
2) Standing still.



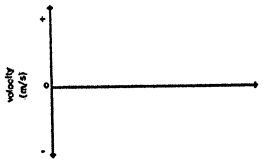
3) Moving away for 10s, then standing still for 10s.



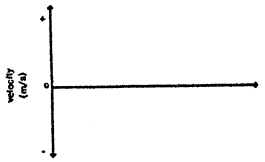
4) CV away for 10s, turn around, then CV towards for 10s.



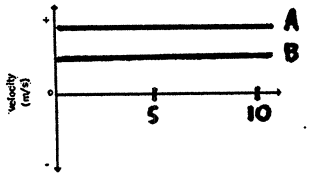
5) Speeding up away for 10s, then constant speed away for 10s.



6) Speeding up away for 10s, then slowing down away for 10s.



"Racing" Questions

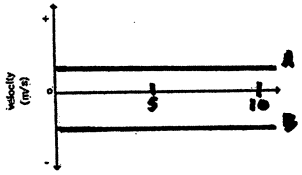


1a) Which car is moving faster at...

- 0 seconds?
- 5 seconds?
- 10 seconds?

b) Can you tell which car starts ahead?

c) Does either car change direction?

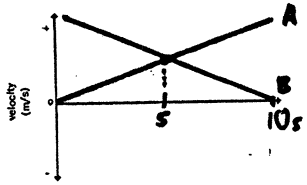


2a) Which car is moving faster at...

- 0 seconds?
- 5 seconds?
- 10 seconds?

b) Can you tell which car starts ahead?

c) Does either car change direction?



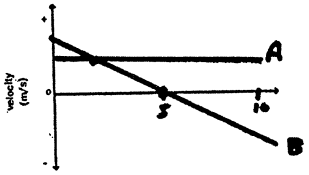
3a) Which car is moving faster at...

- 0 seconds?
- 5 seconds?
- 10 seconds?

b) What does the intersection of the lines mean?

c) Can you tell which car starts ahead?

d) Does either car change direction?



4a) Which car is moving faster at...

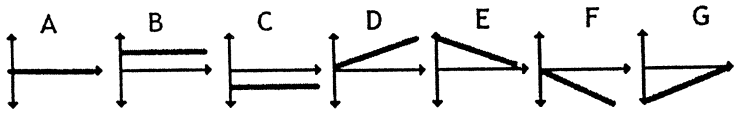
- 0 seconds?
- 5 seconds?
- 10 seconds?

b) What does the intersection of the lines mean?

c) Can you tell which car starts ahead?

d) Does either car change direction?

List all velocity-time graphs that apply where the object is ....



_____ 1. Still

_____ 2. Moving with a constant velocity (including still)

_____ 3. Changing its velocity

_____ 4. Accelerating

_____ 5. Moving with an acceleration of zero

_____ 6. Speeding up

_____ 7. Slowing down

_____ 8. Moving away from the origin

_____ 9. Moving toward the origin

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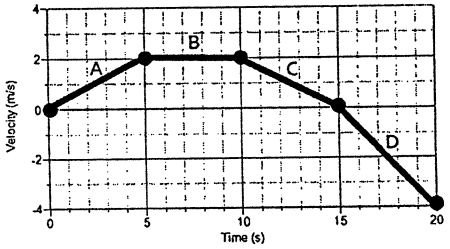
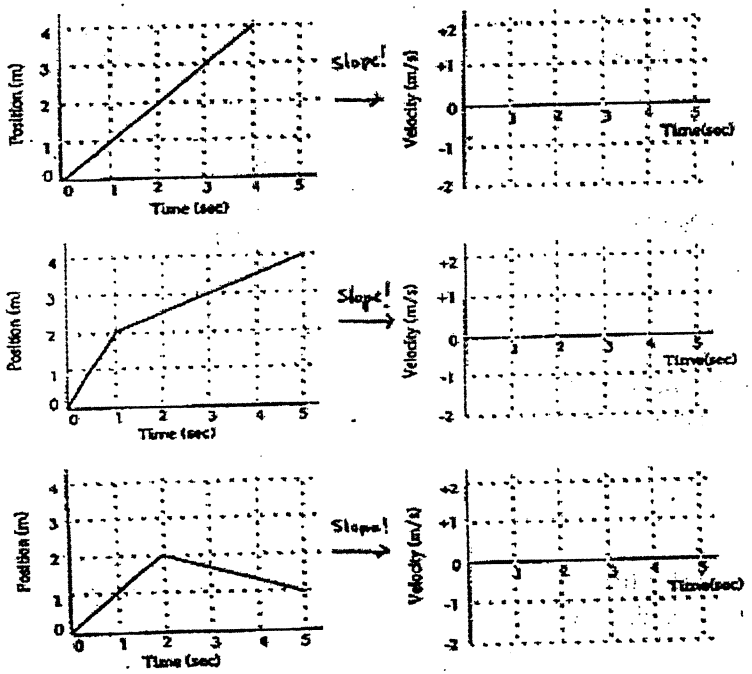
10. List what the object is doing in each phase of motion (Still, CV-Away, Speed Up Towards, etc) and solve for its acceleration in each phase.



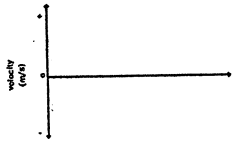
	Motion	Acceleration (m/s^2)
A		
B		
C		
D		

11. Draw the velocity graphs for an object whose motion produced the position-time graphs shown below on the left. Position is in meters and velocity in meters per second. Note: Unlike most real objects, you can assume these objects can change velocity so quickly that it looks instantaneous with this time scale.



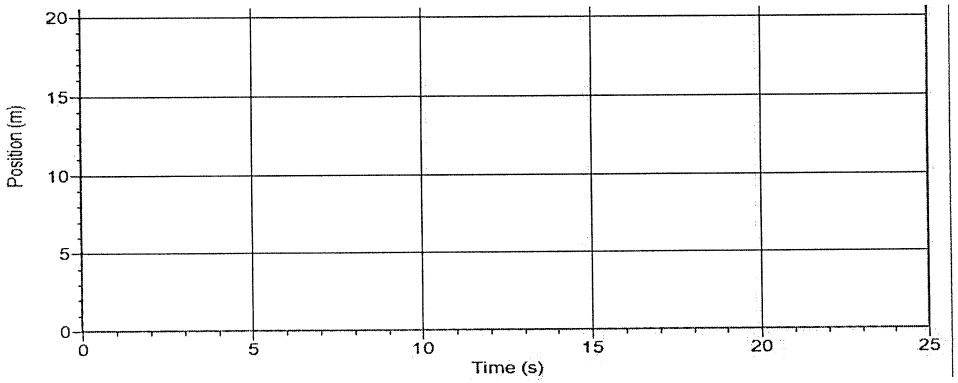
12. When an object goes from a constant velocity of + 10 m/s to – 10 m/s, it has to pass through what number?

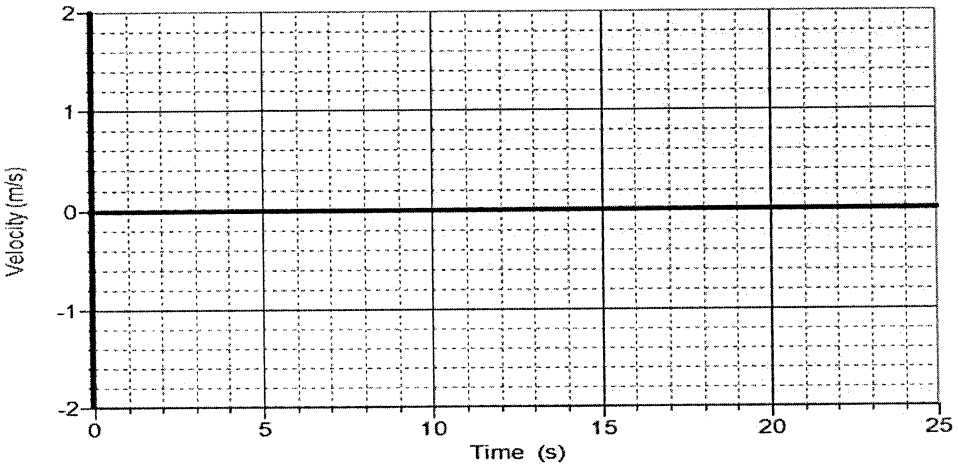
13. Draw a VT graph for an object that changes direction from away to towards.



1)Draw both a PT graph, and a VT graph for this motion. (Hint: draw the PT first)

- A car drives away from the origin at a slow constant velocity for 5 seconds.
- The car then drives at a faster constant velocity away for 5 seconds.
- The car is still for 5 seconds.
- The car drives towards the origin at a constant velocity for 5 seconds.
- The car is still for 5 seconds.





Sign of Acceleration

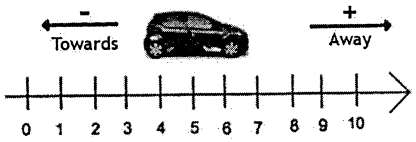
1. Which measurement determines which direction the car is moving (velocity or acceleration)?

2. Which measurement determines whether the car is speeding up or slowing down (velocity or acceleration)?

3. When velocity and acceleration have the same sign (point in the same direction) the car will:
   A) speed up B) slow down C) move at CV D) be still

4. When velocity and acceleration have the opposite sign (point at each other) the car will:
   A) speed up B) slow down C) move at CV D) be still

5. A driver is pointing in the positive direction, away from the origin. Fill in the sign of his velocity and acceleration for each stage of his trip.



	Sign of Velocity (+, -, 0)	Sign of Acceleration (+,-,0)
a) The driver is stepping on the gas, and is speeding up.		
b) The car is moving at a constant velocity.		
c) The driver has stepped on the brakes, and is slowing down.		
d) The driver has shifted into reverse, and is speeding up.		
e) The driver is moving at a constant velocity in reverse.		
f) The driver has hit the brakes, and is slowing down in reverse.		

6. Give an example of a situation where an object can have a negative acceleration and be speeding up.

7. Does positive acceleration always make your car speed up? When would it slow down the car?