

Motion Review Guide

Answer the following questions in preparation for the motion test. Questions 1 through 10 are written responses or sketches. Questions 11 through 13 are word problems, and should be solved with full solutions provided.

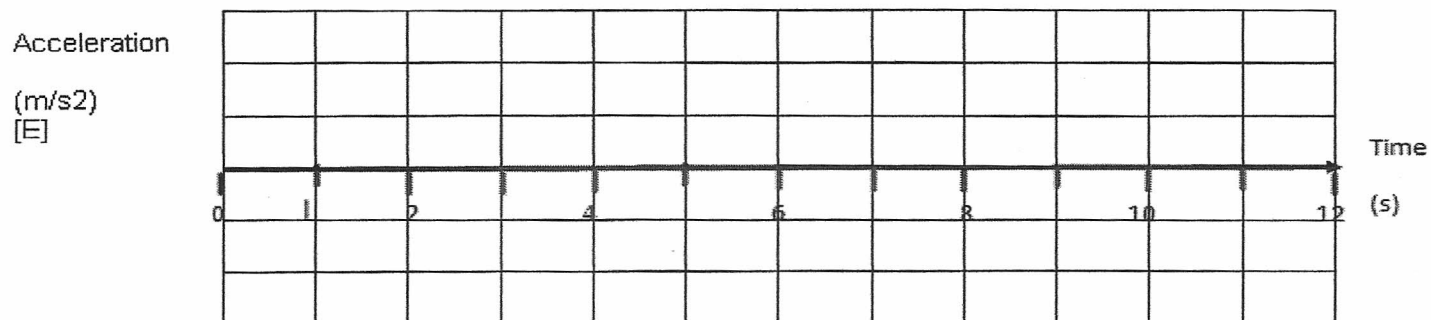
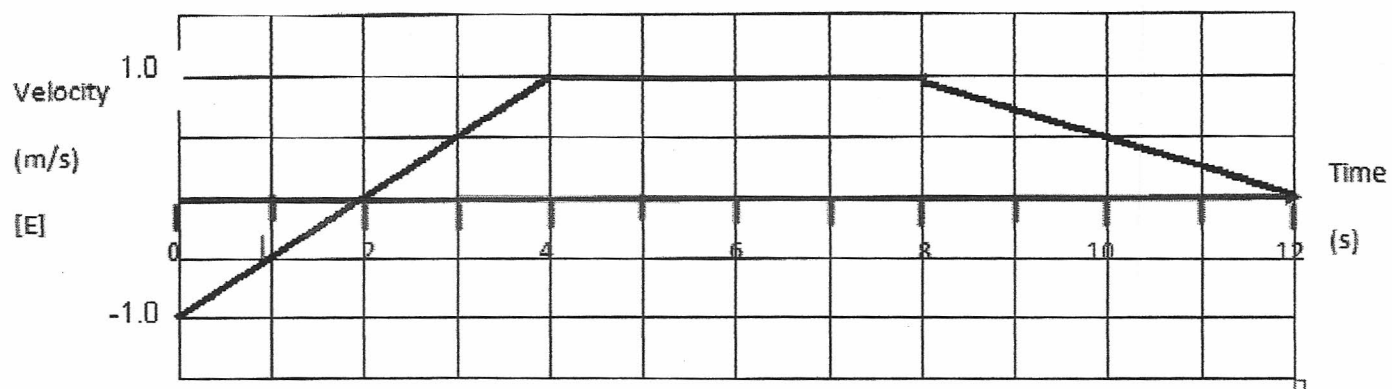
1. Define the following: accuracy, precision, vector, scalar, distance, displacement, speed, velocity, acceleration, uniform motion, uniform acceleration.
2. Sketch position-time and velocity-time graphs for an object undergoing uniform motion and uniform acceleration.
3. How do you determine the average speed from a position-time graph?
4. How do you determine the instantaneous speed from a position-time graph for an object undergoing non-uniform motion?
5. How do you determine acceleration from a velocity-time graph?
6. How do you determine displacement from a velocity-time graph for uniform motion and uniform acceleration?
7. ~~How do you determine displacement from a velocity-time graph for non-uniform acceleration?~~
8. Can an object have zero velocity, but non-zero acceleration? Explain.
9. Can an object have a negative acceleration, but be speeding up? Explain.
10. Contrast uniform motion and uniform acceleration.

Problems and Graph Analysis:

1. After leaving the huddle, a receiver on a football team runs 8.5 m [E], waiting for the ball to be snapped, then he turns abruptly and runs 12.0 m [S], suddenly changes direction, catches a pass and runs 13.5 m [W] before being tackled. The entire motion takes 7.0 s. Determine the receiver's a) average speed and b) average velocity.
2. A student starts at the westernmost position of a circular track of circumference 200.0 m and runs halfway around the track in 13.0 seconds. Determine the student's a) average speed and b) average velocity.
3. In an acceleration test for a sports car, two markers 0.30 km apart were set up along a road. The car passed the first marker with a velocity of 5.0 m/s [E] and passed the second marker with a velocity of 33.0 m/s [E]. Calculate the car's average acceleration between the markers.
4. A plane travelling at 305.0 km/h [W] lands on a runway and begins accelerating uniformly at 2.7 m/s^2 [E].
 - a) What is the plane's velocity after 30.0 s?
 - b) How far has it travelled during this 30.0 second interval?

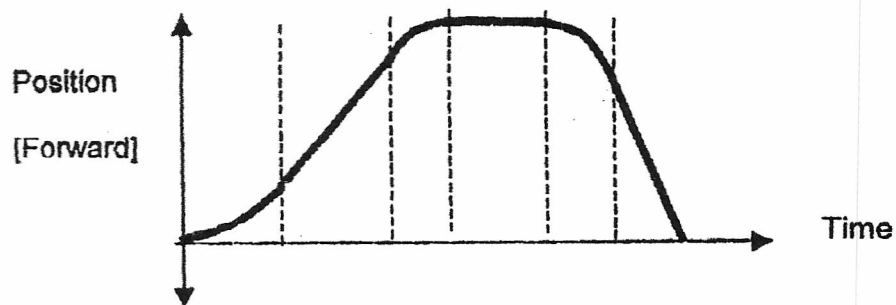
5. For the graph below:

- 1) calculate the acceleration over each interval
- 2) draw the corresponding acceleration-time graph
- 3) find the resultant displacement over the motion



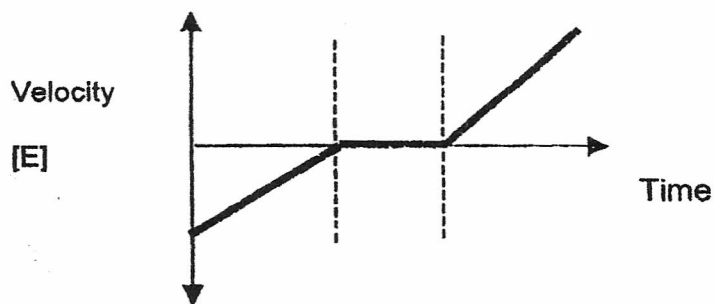
6. Describe the motion of the objects shown in the following graphs over the indicated time intervals.

a)



Interval	1	2	3	4	5	6
Direction of motion						
Moving away from or towards origin						
Velocity description (zero, constant, increasing speed, decreasing speed)						

b)



Interval	1	2	3
Direction of motion			
Velocity description (zero, constant, increasing speed, decreasing speed)			