

NAME _____

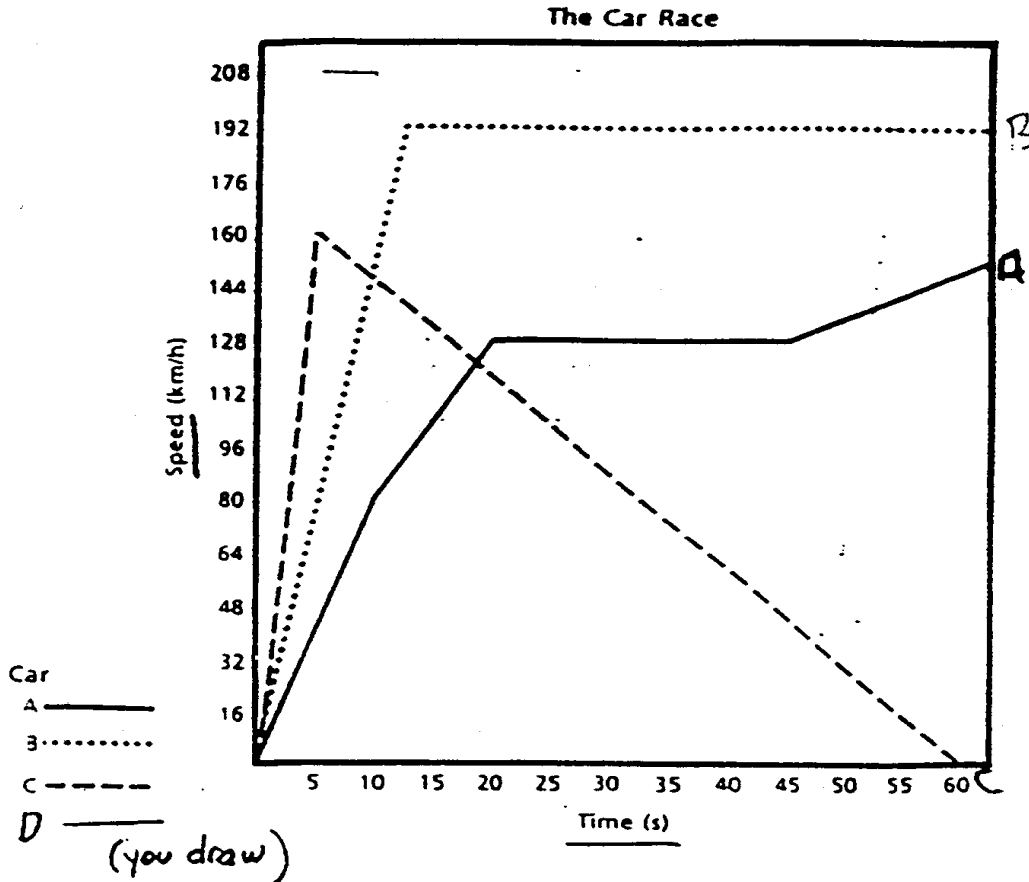
PER _____

DATE _____

MOTION II

1) The graph below represents three cars during the first minute of a race. Using the following information, draw another curve on the grid to represent the motion of Car D!

Car D accelerates from a rest position at 0 seconds to reach a speed of 208 km/h at 5 seconds. D maintains this speed for 5 seconds, then decelerates to 32 km/h at 20 seconds. IT accelerates to reach a speed of 160 km/h at 30 seconds and maintains this speed for 5 seconds. Car D then decelerates to 112 km/h at 40 seconds, further decelerates to 64 km/h at 50 seconds and then accelerates to 208 km/h at 55 seconds.



Use your graph at the top to answer the following questions.

1. Draw Car D's trip
2. What does the vertical axis represent?
3. What does the horizontal axis represent?
4. Over which time period is Car A's acceleration the greatest? ($\text{Acceleration} = \text{Speed} / \text{Time}$)
5. Over which time period is Car B's acceleration the greatest?
6. Over which time period is Car C's acceleration the greatest?
7. When is each car (A, B, C) at an acceleration of zero?
8. Which car(s) deaccelerate during the race?
9. Which car has traveled the farthest at the end of one minute?
10. Which car appears to have a restless driver?
11. Which car appears to have stalled during the race?
12. Which car appears to have the safest driver?

Interpreting and Predicting From Graphs:

Imagine that you are in a car traveling down a long, straight road. Every 10 seconds you record the car's speed. With the speed and time data, you could find some information about the car's acceleration. BY studying a speed-time graph, you could determine when the driver pressed on the accelerator or when the brakes were used.

Study the speed-time graphs for the car trips and write your interpretation under each one:

Figure One shows a car that is going a slow steady speed forward.

Figure Two show a car that is accelerating, or speeding up at a constant rate going forwards.

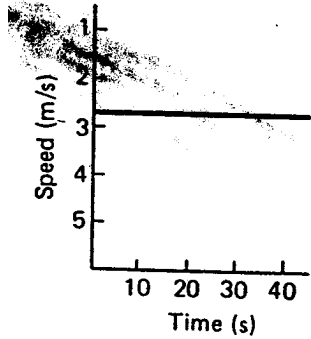


Figure 1.

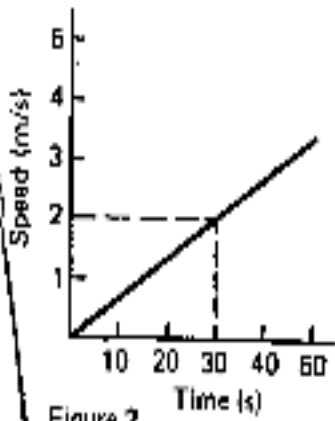


Figure 2.

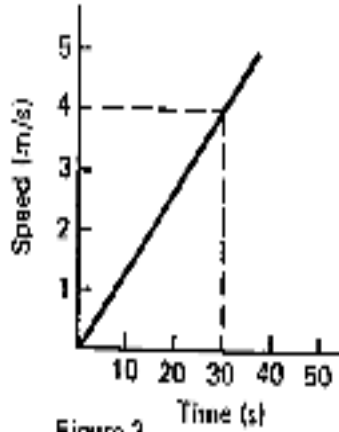


Figure 3.

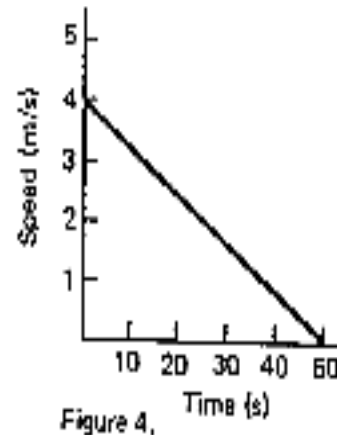


Figure 4.

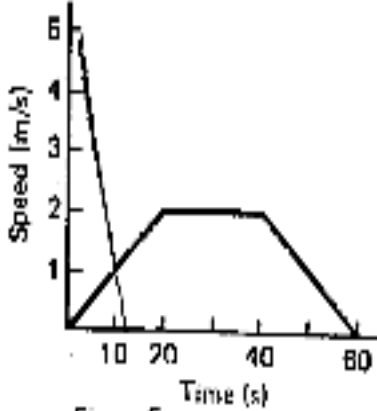


Figure 5.

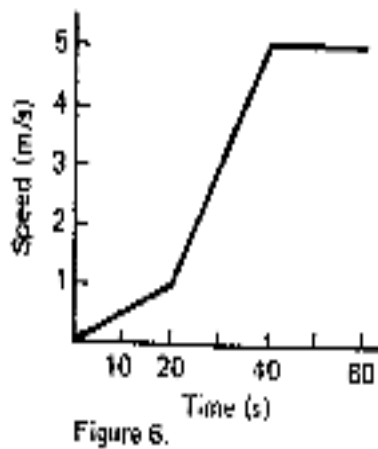


Figure 6.

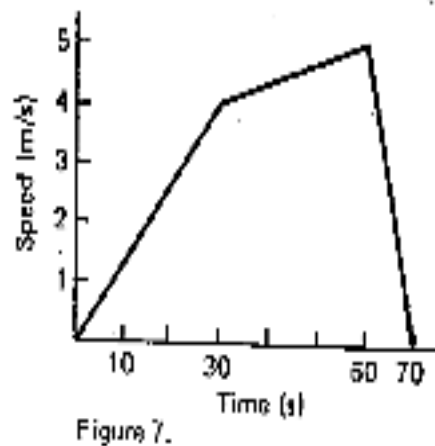


Figure 7.

Describe the car trips. In doing so, tell when the driver accelerated, when the driver used the brakes and decelerated, and whenever possible, compare the acceleration and deceleration.

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)

Now, use your graphing skills to plot the speed-time graph of the following car trip:

At the beginning the car is traveling in a straight line at a constant speed of 3 m/s. After 20 seconds, the car accelerates up to a speed of 5 m/s taking 15 seconds more to reach the new speed. After a total of 35 seconds the car slows down or decelerates. It takes the car an additional 20 seconds to decelerate from 5 m/s to 0 m/s. thus the total time for the car trip was 55 seconds.

Sketch the graph.

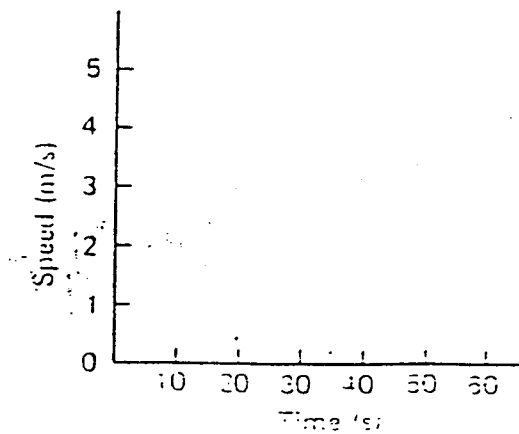
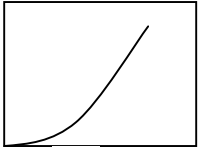


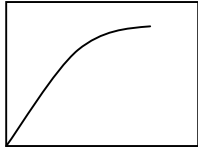
Figure 8.

For each of the following distance time graph sketch below what the velocity time graph would look like

DISTANCE TIME GRAPHS:



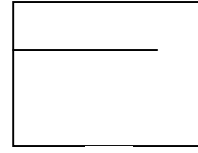
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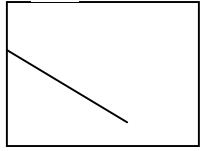
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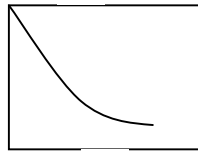
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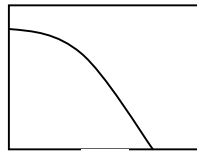
d



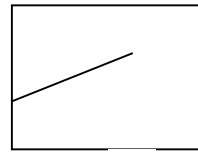
e



f



g



h

Distance across the y, time across the x

VELOCITY TIME GRAPHS



Velocity along the y, time across the x