

Accelerated Motion Analysis Questions

1. One race car has a greater acceleration than a second race car. But the second race car can reach a higher top speed than the first. How is this possible?

Type response here

2. Can a situation exist in which an object has zero acceleration and nonzero velocity? Explain your answer.

Type response here

3. Can a situation exist in which an object has zero velocity and nonzero acceleration, even for an instant? Explain your answer

Type response here

4. If two cars have the same acceleration, do they have the same velocity? Why or why not?

Type response here

5. If two cars have the same velocity, do they have the same acceleration? Why or why not?

Type response here

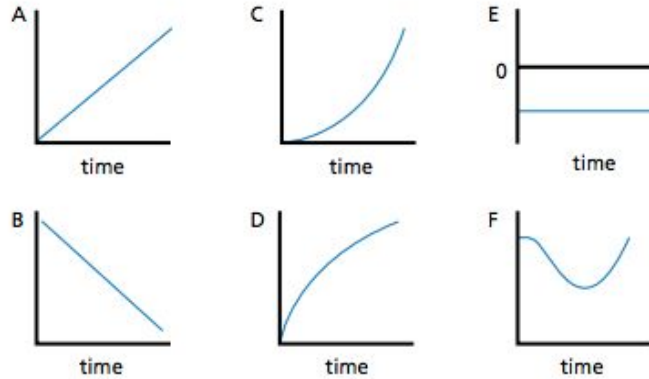
6. Is it correct to refer to speed-limit signs instead of velocity-limit signs? Why or why not?

Type response here

7. A race car leaves the pit after a refueling stop and accelerates uniformly to a speed of 75 m/s in 9 s to rejoin the race. What is the race car's acceleration during this time?

Want	Given	Equation	Solve+Units

8. A boy riding a bike with a speed of 5 m/s across level ground comes to a small hill with a constant slope and lets the bike coast up the hill. All graphs have time on the x-axis. **Match the graphs below to the descriptions of the boy's motion**



Description	Graph
Velocity vs. time as he coasts <u>up</u> the hill	
Position vs. time as he coasts <u>up</u> the hill	
Acceleration vs. Time as he coasts <u>up</u> the hill	
Velocity vs. time as he coasts <u>down</u> the hill	
Position vs. time as he coasts <u>down</u> the hill	

9. Both tables below show the motion of two cars that have negative acceleration.

Example C

Time (s)	Velocity (m/s)
0	8
1	6
2	4
3	2
4	0

Example D

Time (s)	Velocity (m/s)
0	0
1	-2
2	-4
3	-6
4	-8

These are both examples of negative acceleration.

What is similar about the motion of the cars? What is different?

Similar	Different

10. Which car is speeding up?
11. Which car is slowing down?

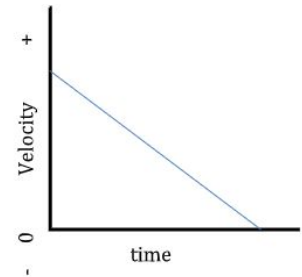
12. Arlene slams on the brakes and decreases velocity from 8 m/s to 2 m/s in a time of 0.5 seconds. Calculate the acceleration.

Want	Given	Equation	Solve+Units

13. Oscar gently hits the brakes and slows down from 16 m/s to 10 m/s in a time of 2.5 seconds. Calculate the acceleration.

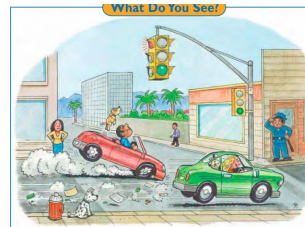
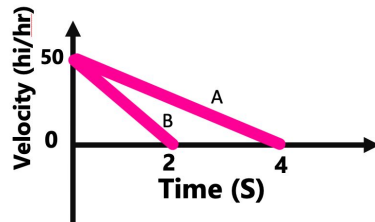
Want	Given	Equation	Solve+Units

14. Ariel is driving a car. The graph to the right shows her velocity over time. Which of the following describes the car's motion?



- The car has a constant speed.
- The car has a positive acceleration.
- The car has a negative acceleration.
- The car has a negative velocity.

15. The graphs below show the negative acceleration of two cars as they stopped for a red light.



- What is different about the motion of the cars in the picture as they slow to a stop? What is similar?

Type response here

- Which line, A or B, matches the front car? Which graph matches the back car? Explain how you know.

Type response here

- Which car do you think stopped more safely? Why?

Type response here

