

Motion and Forces Study Guide

Name: _____ Period: _____

- _____ 1. A passenger in the rear seat of a car moving at a steady speed is at rest relative to _____
- _____ 2. What is conserved when two objects collide in a closed system?
- _____ 3. Newton's third law of motion describes
a. action and reaction forces. c. centripetal forces.
b. balanced forces. d. net force.
- _____ 4. What is the momentum of a 60-kilogram ice skater gliding across the ice at a speed of 7 m/s?
- _____ 5. An apple might roll off your cafeteria tray when you stop suddenly because of _____
- _____ 6. The property of matter that resists changes in motion is called _____
- _____ 7. When an unbalanced force acts on an object, _____
- _____ 8. The slope of a speed-time graph indicates _____
- _____ 9. Which example describes constant acceleration due ONLY to a change in direction?
a. increasing speed while traveling around a curve
b. an object at rest
c. traveling around a circular track
d. an object in free fall
- _____ 10. As you push a cereal box across a tabletop, the sliding friction acting on the cereal box
a. acts in the direction of motion.
b. equals the weight of the box.
c. is usually greater than static friction.
d. acts in the direction opposite of motion.
- _____ 11. If you know your mass, how could you calculate your weight?
- _____ 12. What kind of friction occurs as a fish swims through water?

- ___ 13. A train approaching a crossing changes speed from 25 m/s to 10 m/s in 240 s. How can the train's acceleration be described?
- ___ 14. An object that is accelerating may be
- a. slowing down.
 - b. gaining speed.
 - c. changing direction.
 - d. all of the above
- ___ 15. When a pair of balanced forces acts on an object, the net force that results is
- ___ 16. In which of the following are action and reaction forces involved?
- a. when a tennis racket strikes a tennis ball
 - b. when stepping from a curb
 - c. when rowing a boat
 - d. all of the above
- ___ 17. The forces acting on a falling leaf are
- ___ 18. Projectile motion is caused by
- ___ 19. The slope of a line on a distance-time graph is
- ___ 20. According to Newton's second law of motion, the acceleration of an object equals the net force acting on the object divided by the object's
- ___ 21. The product of an object's mass and velocity is its
- ___ 22. Suppose you increase your walking speed from 2 m/s to 4 m/s in a period of 1 s. What is your acceleration?
- ___ 23. If a force of 14 N is applied to an object with a mass of 5 kg, the object will accelerate at
- ___ 24. The SI unit of force is the
- ___ 25. What is the speed of a bobsled whose distance-time graph indicates that it traveled 50 m in 25 s?
- ___ 26. The rate at which velocity changes is called

Completion

Complete each statement.

27. The force that opposes the motion of objects that touch as they move past each other is called _____.
28. The path of motion of a thrown javelin is an example of _____ motion.
29. $\bar{v} = \frac{d}{t}$ is the equation that defines _____.
30. The acceleration of an object is equal to the net _____ acting on the object divided by the object's _____.
31. If the forces acting on an object produce a net force of zero, the forces are called _____.
32. If a golf ball and bowling ball are rolling at the same speed, the _____ ball has greater momentum.
33. The acceleration of a moving object is calculated by dividing the change in _____ by the time over which the change occurs.
34. The difference between speed and velocity is that velocity indicates the _____ of motion and speed does not.
35. The tendency of an object to resist any change in its motion is called _____.
36. A push or pull is an example of a(an) _____.

Predict how the object will move:

37.

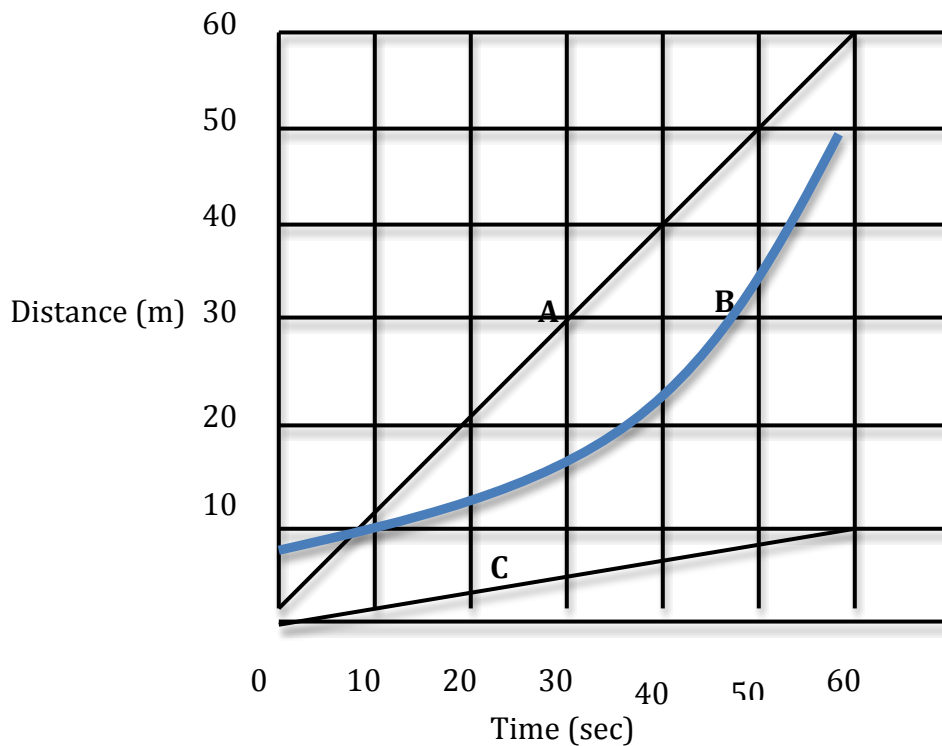


Predict how the object will move:

38.



The graph below shows the speed of three race cars over a one-minute period.

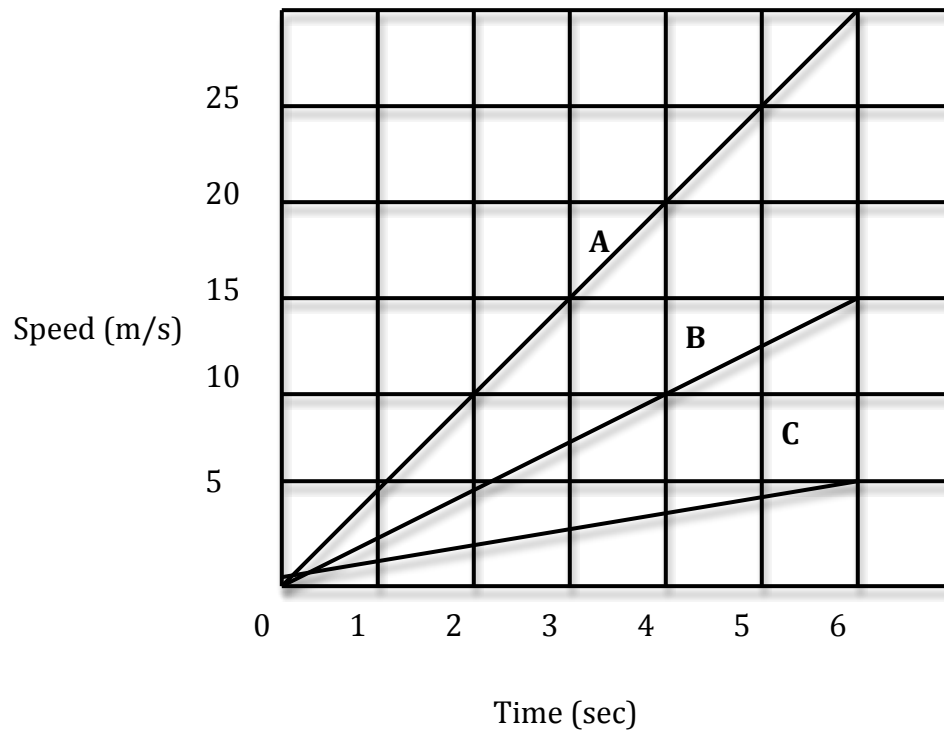


Use the above graph to answer the following questions:

39. Which car travelled the furthest?
40. Which swimmer was the slowest?
41. Which line show deceleration?
42. Which car was the fastest?
43. Predict what distance car A will have at 70 sec.
44. What is the average speed for car A?
45. Which car had constant speed?
46. Which line(s) shows acceleration?
47. How far did car A go at 30 sec?
48. If swimmer C got a cramp, and couldn't finish the race, his graph from 30 sec on would be

- a.  b.  c. 

The below graph shows the acceleration of three rabbits over six-seconds.



Use the above graph to answer the following questions:

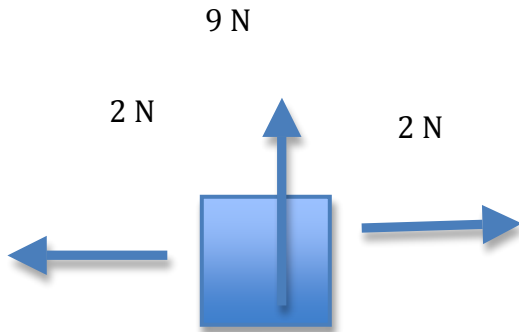
49. Which rabbit was the fastest?
50. Which rabbit was the slowest?
51. Which line show deceleration?
52. Which rabbit had constant speed?
53. Which rabbit went the farthest?
54. Which rabbit had the most acceleration?

EXCEEDS:

1. Describe how the moon stays in orbit around the Earth, show the forces and what its motion is around Earth.



2. Predict how the box will move (show direction) and with what force it will contain (? N).



3. Describe how these football players show each of Newton's three laws.



4. Describe, in detail, as many forces (at least 3) acting on the below picture.



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5. Why will a human body not fall any faster than 120?

