

1 pt

While passing a slower car on the highway, you accelerate uniformly from 19.8 m/s to 27.0 m/s in a time of 10.9 s. How far do you travel during this time?
(in m)

1. A ☐ 1.56×10^2 B ☐ 1.77×10^2 C ☐ 2.00×10^2
D ☐ 2.26×10^2 E ☐ 2.55×10^2

1 pt

What is your magnitude of acceleration?
(in m/s²)

2. A ☐ 2.71×10^{-1} B ☐ 3.38×10^{-1} C ☐ 4.23×10^{-1}
D ☐ 5.28×10^{-1} E ☐ 6.61×10^{-1}
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1 pt

A cheetah can accelerate from rest to 25.1 m/s in 2.10 s. Assuming the acceleration is constant over the time interval, what is the magnitude of the acceleration of the cheetah?
(in m/s²)

3. A ☐ 7.46 B ☐ 8.73 C ☐ 1.02×10^1
D ☐ 1.20×10^1 E ☐ 1.40×10^1

1 pt

What is the distance traveled by the cheetah in these 2.10 s?
(in m)

4. A ☐ 8.42 B ☐ 1.12×10^1 C ☐ 1.49×10^1
D ☐ 1.98×10^1 E ☐ 2.64×10^1

1 pt

A runner can accelerate from rest to 5.61 m/s in the same time, 2.10 s. What is the magnitude of the acceleration of the runner?
(in m/s²)

5. A ☐ 2.67 B ☐ 3.34 C ☐ 4.17 D ☐ 5.22
E ☐ 6.52

1 pt

By what factor is the cheetah's average acceleration magnitude greater than that of the runner?

6. A ☐ 4.47 B ☐ 5.95 C ☐ 7.91
D ☐ 1.05×10^1 E ☐ 1.40×10^1
-

1 pt

An airplane lands and starts down the runway at a northwest velocity of 55.7 m/s. What constant acceleration allows it to come to a stop in 1.24 km?
(in m/s²)

7. A ☐ 1.25 B ☐ 1.41 C ☐ 1.60 D ☐ 1.81
E ☐ 2.04 southeast
-

1 pt

Neglecting air resistance, from what height must a hockey puck drop if it is to attain a speed of 27.4 m/s (approximately 61.3 mi/h) before striking the ground?
(in m)

8. A ☐ 1.57×10^1 B ☐ 1.96×10^1 C ☐ 2.45×10^1
D ☐ 3.06×10^1 E ☐ 3.83×10^1

1 pt

If the puck comes to a full stop in a time of 1.07 s from initial impact, what acceleration (assumed constant) is experienced by the puck during the impact with the ground?

(in m/s²)

9. A ☐ 5.79 B ☐ 8.40 C ☐ 1.22×10^1
D ☐ 1.77×10^1 E ☐ 2.56×10^1 up
-

1 pt

A car is speeding up and has an instantaneous speed of 1.17 m/s when a stopwatch reads 11.6 s. It has a constant acceleration of 2.36 m/s^2 . What change in speed occurs between $t = 11.6 \text{ s}$ and $t = 13.0 \text{ s}$?

(in m/s)

10. A ☐ 1.76 B ☐ 2.06 C ☐ 2.41 D ☐ 2.82
E ☐ 3.30

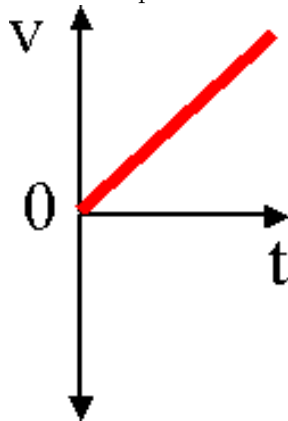
1 pt

What is the speed when the stopwatch reads 13.0 s?
(in m/s)

11. A ☐ 3.09 B ☐ 4.47 C ☐ 6.49
D ☐ 9.41 E ☐ 1.36×10^1

1 pt

Look at the v vs. t graph for an object in motion and indicate the correct description of what is actually happening



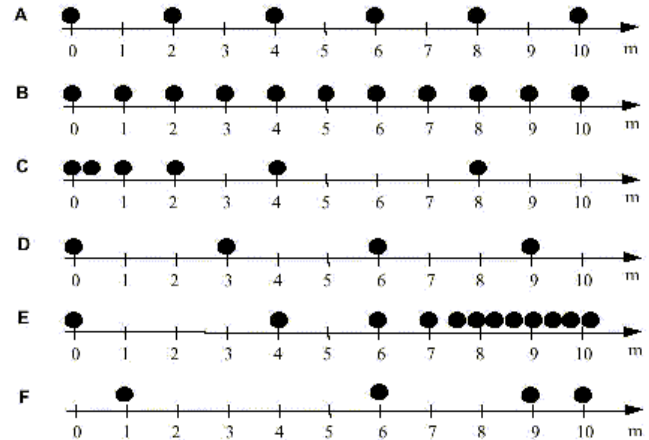
to the object.

12, 13 (Bubble once in 2 lines)

- 12 A ☐ the object starts from rest, and then accelerates in a negative direction
12 B ☐ the object starts from rest, and then accelerates in a positive direction
12 C ☐ the object starts with some initial velocity in the negative direction and is accelerating in that (negative) direction
12 D ☐ the object starts with some initial velocity in the negative direction, decelerates and stops, and then begins to accelerate in the positive direction
12 E ☐ the object starts with some initial velocity in the positive direction and is accelerating in that (positive) direction
13 A ☐ the object starts with some initial velocity in the positive direction, decelerates and stops, and then begins to accelerate in the negative direction

1 pt

Flash snapshots were taken at time intervals of 1 second of a set of spheres moving from left to right. The diagrams below show the locations of each sphere when each photo was taken (these are called motion diagrams). The x-axis shown represents the position of the sphere (in units of meters) at these 1-second intervals. The positive direction is to the right.



Which of the following statements are true about the motion of the spheres depicted in these motion diagrams?

▷ The velocity in figure A is 2 m/s

14. A ☐ True B ☐ False

▷ The acceleration in figure A is less than that in figure B

15. A ☐ True B ☐ False

▷ The acceleration in figure F is positive

16. A ☐ True B ☐ False

▷ The velocity in figures A, D and F is constant

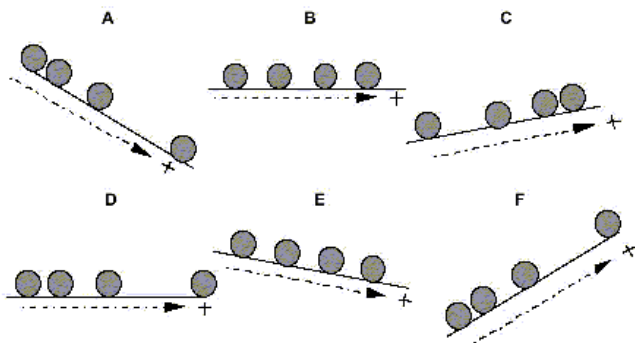
17. A ☐ True B ☐ False

▷ The velocity in figure B is increasing

18. A ☐ True B ☐ False

1 pt

The drawings indicate the motion of a ball (moving from left to right), subject to one or more forces on various surfaces. Each circle represents the position of the ball at succeeding instants of time. The time interval between each circle is one second.



Which of the following statements are true about the motions depicted in the figures above? (Give ALL correct answers: B, AC, BCD., or None)

▷ The acceleration of the ball in pictures A, D and F is positive

19. A ☐ True B ☐ False

▷ The velocity of the ball in pictures D and E is constant

20. A ☐ True B ☐ False

▷ The velocity of the ball in pictures B and E is decreasing

21. A ☐ True B ☐ False

▷ The acceleration of the ball in pictures A, B and F is zero

22. A ☐ True B ☐ False

▷ The velocity of the ball in pictures D and F is increasing

23. A ☐ True B ☐ False

1 pt If that ball had been released from the same height, but this time above the surface of the moon, how long would it have taken for the ball to hit the ground?

(in s)

25. A ☐ 5.58 B ☐ 6.30 C ☐ 7.12 D ☐ 8.05
E ☐ 9.09

1 pt Ball A is dropped from the top of a building. One second later, ball B is dropped from the same building. Consider the balls while they are both in flight. You may ignore air resistance. Which statements are true about this situation?

▷ As time progresses, the difference between their velocities increases

26. A ☐ True B ☐ False

▷ Both are under the influence of gravity only

27. A ☐ True B ☐ False

▷ The difference between their accelerations is always zero

28. A ☐ True B ☐ False

▷ As time progresses, the distance between them decreases

29. A ☐ True B ☐ False

▷ Both balls will hit the ground simultaneously

30. A ☐ True B ☐ False

1 pt It takes 2.60 s for a small ball with a mass of 0.060 kg released from rest from a tall building to reach the ground. Calculate the height from which the ball is released.

(in m)

24. A ☐ 2.60×10^1 B ☐ 2.93×10^1 C ☐ 3.32×10^1
D ☐ 3.75×10^1 E ☐ 4.23×10^1