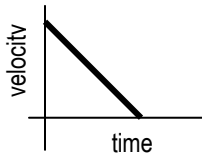


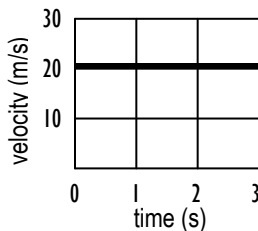
*Multiple Choice: Choose the one best answer for each of the following questions.
Write on this test; it is your copy.*

- 1 A car accelerates from rest up to a speed of 15 m/s in 2.5 s. What is its acceleration in m/s^2 ?
(a) 0.17 (b) 37.5 (c) 5.25 (d) 6.0 (e) 15

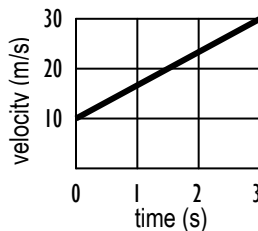
- 2 The motion of a moving particle is shown below. The particle's acceleration is
(a) positive and constant
(b) positive and increasing
(c) negative and decreasing
(d) negative and constant
(e) zero



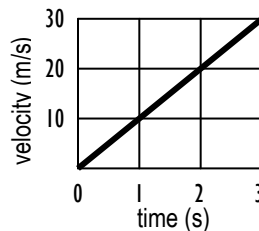
Questions 3-7 refer to the four velocity-time graphs shown below.



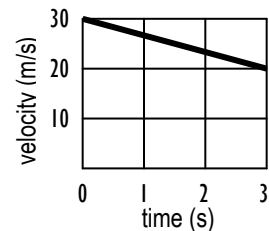
(a)



(b)



(c)

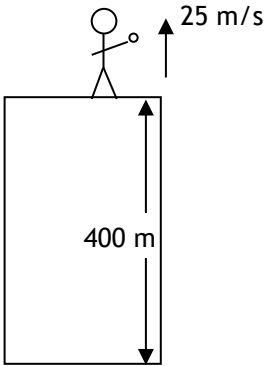


(d)

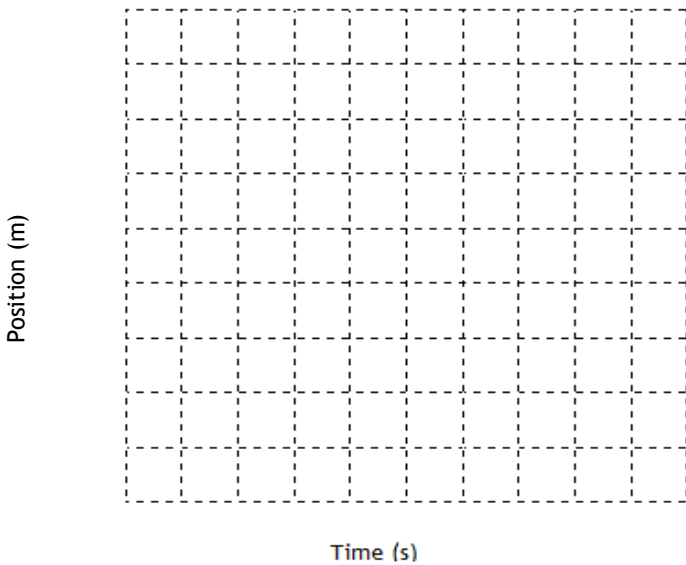
- 3 Which object was slowing down?
(a) a (b) b (c) c (d) d (e) none of the above
- 4 Which object had the greatest absolute value (magnitude) of acceleration?
(a) a (b) b (c) c (d) d (e) none of the above
- 5 Compared with the average velocity of object c, the average velocity of object b is
(a) the same (b) less (c) greater (d) None of the above
- 6 Which object traveled the greatest distance in the 3.0 second interval?
(a) a (b) b (c) c (d) d (e) none of the above
- 7 Which object was neither accelerating nor decelerating?
(a) a (b) b (c) c (d) d (e) none of the above
- 8 A runner jogs east at 8 m/s for 60 s and then west at 5 m/s for 30 s. The runner's average speed is
(a) 6.5 m/s (b) 7.0 m/s (c) 3.7 m/s (d) 4.6 m/s (e) 7.5 m/s

- 9 A cruise ship decelerates at -0.20 m/s^2 for 30 seconds. The ship's speed after the deceleration is 12 m/s. What was its speed just before the deceleration?
(a) 15 m/s (b) 12.2 m/s (c) 9.0 m/s (d) 6.0 m/s (e) 18 m/s
- 10 Which of the following statements concerning a body's velocity and acceleration is not possible?
The body has
(a) an instantaneous velocity to the east and a westerly acceleration
(b) an instantaneous velocity to the west and an easterly acceleration
(c) a changing velocity and a changing acceleration
(d) a changing velocity and a constant acceleration
(e) a constant velocity and a changing acceleration
- 11 An object is shot vertically upward into the air with a positive initial velocity. Which of the following correctly describes the signs for the velocity and acceleration of the object at its maximum height?
(a) $+v, +a$ (b) $0 v, -a$ (c) $-v, -a$ (d) $+v, -a$ (e) $0 v, 0 a$
- 12 A ball is dropped from a cliff. After t seconds it has achieved a final velocity v and displacement d . If the time of the experiment were doubled to $2t$, the ball's displacement would be
(a) $d\sqrt{2}$ (b) $2d$ (c) $2d\sqrt{2}$ (d) $4d$ (e) $8d$
- 13 A ball is dropped from a cliff. After t seconds it has achieved a final velocity v and displacement d . If the time of the experiment were doubled to $2t$, the ball's final velocity would be
(a) $v\sqrt{2}$ (b) $2v$ (c) $2v\sqrt{2}$ (d) $4v$ (e) $8v$
- 14 In the absence of air resistance, an object dropped near the surface of the earth experiences a constant, downward acceleration of about 9.8 m/s^2 . This means that the
(a) speed of the object increases 9.8 m/s during each second
(b) speed of the object as it falls is 9.8 m/s
(c) object falls 9.8 meters during each second
(d) object falls 9.8 meters during the first second only
(e) None of the above
- 15 A particle decelerates from an initial speed of $+5 \text{ m/s}$ to a stop and covers 25 m while doing so. Its acceleration (in m/s^2) was
(a) -5.0 (b) -2.0 (c) -1.0 (d) -0.5 (e) None of these

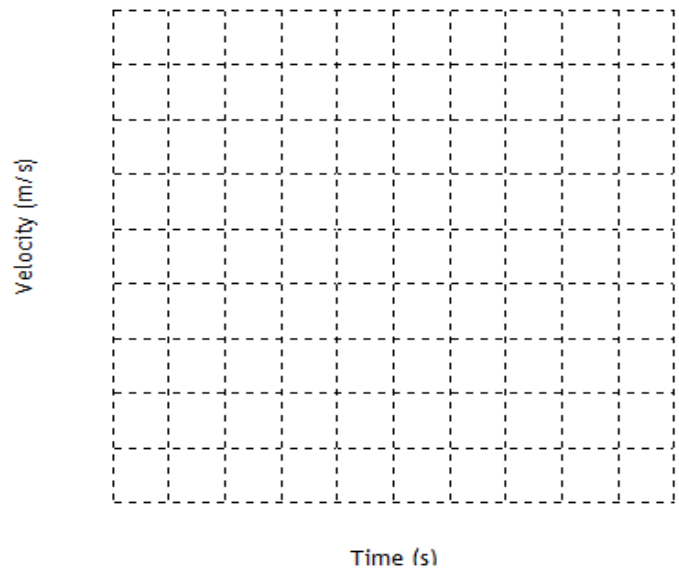
A ball is thrown from atop a 400 m building up-wards at a velocity of 25 m/s.



a) Complete a position vs. time graph for the object's motion.



b) Complete a velocity vs. time graph for the object's motion.



c) How far above the ground is the ball at 6 seconds?

d) Another ball is thrown downwards from the same height at 25 m/s, at the same time as the ball thrown upward at 25 m/s.

i) Which ball will hit the ground first?

- thrown upwards one thrown downwards one same

ii) Which ball will hit the ground with the greater speed?

- thrown upwards one thrown downwards one same

iii) Which ball will have the greater acceleration while in flight?

- thrown upwards one thrown downwards one same

A rocket car accelerates uniformly from rest and reaches a maximum velocity of 150 m/s through a distance of 510m. The boosters are then turned off and the rocket car coasts to a stop in 22 seconds (this time is from the moment the boosters are turned OFF).



a) What is the acceleration of the car while the boosters are ON??

b) How far does the booster coast from the moment the boosters are turned OFF?

c) What is the average velocity of the car for the whole trip?

d) Sketch the general shape of the rockets motion on the following graphs. Numbers are not need, only the general shape.

