

Quiz.

1. An example of acceleration is _____. (Circle all that apply.)
 - a) speeding up
 - b) falling at terminal velocity
 - c) slowing down
 - d) turning

2. Speed is a _____, and velocity is a _____.
 - a) scalar, scalar
 - b) vector, scalar
 - c) scalar, vector
 - d) vector, vector

3. A scalar has _____.
 - a) direction only
 - b) magnitude and direction
 - c) magnitude only

4. A vector has _____.
 - a) magnitude and direction
 - b) magnitude only
 - c) direction only

5. If an object has constant velocity, than it's acceleration is _____.
 - a) zero
 - b) 10 m/s/s

6. During each second of free fall, _____. (Circle all that apply.)
 - a) an object gains a speed of ten meters per second
 - b) an object maintains constant velocity
 - c) an object maintains constant acceleration

7. Ron walks east on a train moving 10 m/s eastbound. Ron's speed relative to the train is 2 m/s and _____ relative to the train tracks.
 - a) 2 m/s
 - b) 5 m/s
 - c) 8 m/s
 - d) 12 m/s

8. It is possible to have a negative speed.
 - a) True
 - b) False

9. It is possible to have a negative velocity.
- a) True
 - b) False
10. A gazelle travels 2 km in a half hour. The gazelle's average speed is _____.
- a) 1/2 km/h
 - b) 1 km/h
 - c) 4 km/h
 - d) 2 km/h
11. In a vacuum tube, a feather is seen to fall as fast as a coin. This is because _____.
- a) air resistance doesn't act in a vacuum
 - b) gravity doesn't act in a vacuum
 - c) greater air resistance acts on the coin
 - d) gravity is greater in a vacuum

Answer Key.

1. a), c), & d)

Acceleration is the change in velocity over time. Therefore, changing speed and changing direction are both methods of acceleration. When falling at terminal velocity the acceleration is zero.

2. c)

A scalar has a magnitude only, while a vector has a magnitude and a direction.

3. c)

An example of a scalar would be the price of milk. It does not make sense to ask what the direction is of the price of milk.

4. a)

An example of a vector would be the velocity of an airplane. You care about both speed *and* direction if you want to reach the correct destination.

5. a)

If your velocity is not changing, then the final velocity minus the initial velocity is zero. In other words, the change in velocity is zero.

6. a) & c)

During free fall, according to the physics definition, the only force present is gravity. Near Earth, the acceleration due to gravity is about ten meters per second squared. Although the object's velocity is increasing, it's changing at a constant rate of acceleration.

7. d)

Ron's motion relative to the tracks is 2 m/s greater than the speed of the train since both he and the train are headed in the same direction.

8. b)

A negative speed would indicate a negative distance traveled or a negative time interval. Neither of these is possible.

9. a)

A negative velocity would indicate either a negative distance traveled, a negative time interval, or a negative direction of travel. The first two options are not possible, but the third is.

10. c)

Two kilometers divided by a half hour equals four kilometers per hour.

11. a)

In the absence of air resistance, falling objects accelerate towards Earth at the same rate, regardless of mass.