8.1

1. (a) Scalar   (b) Vector   (c) Scalar   (d) Vector   (e) Scalar

2. (a) 5 s   (b) 2 s

3. (a) Distance describes the length of a path between two points or locations.

(b) Position describes a specific point relative to a reference point.

(c) Displacement describes the straight-line distance and direction from one point to another.

4. (a) 10 m [S]   (b) 5.0 m/s down   (c) +20 cm/h   (d) 50 km/h [E]   (e) +15 km
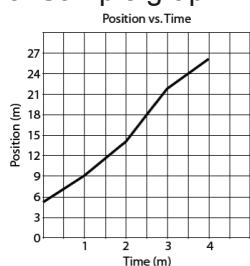
5. Sample graph:

6. (a) No   (b) The object travels different distances during different time intervals.

7. Sample graph:
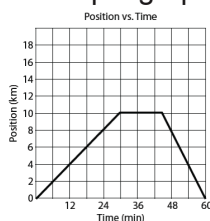
8. D   9. A   10. A   11. C   12. B   13. D   14. A   15. A   16. C   17. B

8.2

1. displacement

2. distance

3. (a) Jogger A   (b) The slope is steeper.

4. t_1 to t_2 5. 0 to t_1 6. t_2 to t_3 7. 2.3 m/s [E]   8. 120 m [N]

9. (a) 5.0 m/s   (b) 0.5 m/s [W]   10. 4. 15 s

11. (a) 10 m/s   (b) 72 km/h

12. C   13. D   14. B   15. C   16. B   17. C   18. C   19. A   20. D   21. B

9.1

1. (a) +2 m/s   (b) −3 m/s   (c) −2 m/s

2. Acceleration is the rate of change in velocity.

3. Speed, direction of motion (or both)

4. Deceleration is acceleration that is opposite the direction of motion.

5. The car is slowing down, as indicated by the negative sign in front of the acceleration. (It is not possible from the information given to know whether the car is moving forwards or backwards, only that it is slowing down.)

6. Accept any answer indicating an object that is moving forward while also slowing down.

7. A   8. D   9. B   10. C   11. A   12. D   13. C   14. A   15. B   16. A

9.2

1. (a) t_1 to t_2 (b) t_2 to t_3 (c) 0 to t_1 (d) 0 to t_1 (e) t_2 to t_3 (f) t_1 to t_2
2. 4.0 m/s [W]   3. 1.0 m/s forward   4. 4.0 s   5. 34 m/s downward
6. 0.82 s   7. 23 m/s downward
8. A   9. D   10. D   11. B   12. C   13. B   14. C   15. A   16. D   17. C