1. (a) The odometer shows the true distance the car has been *driven*, but not the true distance it has been transported.
   (b) If car is returned to site of manufacture its displacement is zero even though it has traveled great distance.
2. a. diagram forms a "sideways M"
   b. 10.0 yds, 270.0°
   c. 42.4 yds
   d. 50.0 yds, 90.0° from S. goal
3. a. 9.47×10^{15} m
   b. 1.28 s
   c. 99 days
4. a. 57 miles, 270°
   b. 110 mph, 270°
   c. 20 miles, 90° from airport
5. 18 m
6. a. 300 km/h (190 mph!)
   b. 120 km/h
7. a. $t = 14.7$ s, $x = 3.4$ m west
   b. 0.20 m/s, west
   c. 0.47 m/s
   d. 1.0 m/s, west
   e. 0.30 m/s, increasing
   f. $x = 5.0$ m, east and $x = 3.4$ m, west
   g. 1.0 m/s
8. Graph w/ line and two curves…
9. a. 0.36 m/s^2
   b. 3.0 s
10. 25.2 *g*
11. 15.9 s
12. 46 m/s, north
13. a. 25% decrease
   b. 7.3 s (true!)
14. a. yes – object reversing direction
   b. yes – object on curved path
   c. no – if speed changes so does velocity
   d. yes – cruising at constant velocity
   e. yes – object's speed is decreasing
15. a. 0 s < *t* < 26 s
   b. 30 m/s
   c. 2.2 m/s^2, 90°
   d. 2.5 m/s^2, 270°, speed increasing
   e. 5.0 m/s^2, 90°
   f. 12 s < *t* < 20 s, 27 s < *t* < 32 s
      38 s < *t* < 50 s
   g. 20 s < *t* < 26 s, 32s < *t* < 38 s
16. a. 180 m, S
   b. 63 m, S
   c. 550 m