Section 2.2, pp. 169–172

1. **(a)** $\Delta s = -2\text{m}$, $v_{\text{av}} = -1$ m/sec
(b) $|v(0)| = 3$ m/sec, $|v(2)| = 1$ m/sec, $a(0) = a(2) = 2$ m/sec^2
(c) At $t = \frac{3}{2}$

3. **(a)** $\Delta s = -9$ m, $v_{\text{av}} = -3$ m/sec
(b) $|v(0)| = 3$ m/sec, $|v(3)| = 12$ m/sec, $a(0) = 6$ m/sec^2 and $a(3) = -12$ m/sec^2
(c) Never changes direction

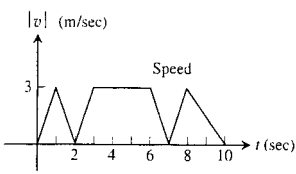
5. **(a)** $a(1) = -6$ m/sec^2 and $a(3) = 6$ m/sec^2
(b) $|v(2)| = 3$ m/sec
(c) Total distance $= |s(1) - s(0)| + |s(2) - s(1)| = 6$ m

7. $t \approx 7.5$ sec on Mars, $t \approx 1.2$ sec on Jupiter

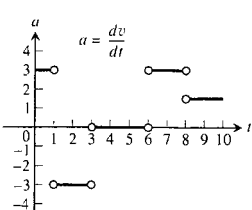
9. $g_s = 0.75$ m/sec^2

11. **(a)** $v = -32t$, $|v| = 32t$ ft/sec, $a = -32$ ft/sec^2
(b) $t \approx 3.3$ sec **(c)** $v \approx 107.0$ ft/sec

13. **(a)** $t = 2, t = 7$ **(b)** $3 \le t \le 6$
(c)



(d)



15. **(a)** 190 ft/sec **(b)** 2 sec
(c) 8 sec, 0 ft/sec **(d)** 10.8 sec, 90 ft/sec
(e) 2.8 sec **(f)** 2 sec after launch
(g) between 2 and 10.8 sec, -32 ft/sec^2

17. **(a)** $\frac{4}{7}$ sec, 280 cm/sec
(b) 560 cm/sec, 980 cm/sec^2
(c) 29.75 flashes/sec

19. C = position, B = velocity, A = acceleration

21. **(a)** \$2 **(b)** \$2 **(c)** 0

23. -8000 gal/min, $-10{,}000$ gal/min

25. **(a)** 16π ft^3/ft **(b)** 3.2π ft^3