Chapter 3

1. A 2. C 3. C 4. A (the assumption is that deceleration implies a negative answer)

6. A (+ve is down; therefore acceleration is +ve)

7. B

8. $v_f = 35\ m/s$

$a = 4.0\ m/s^2$

$t = 5.0s$

$v_f = v_i + at$

$v_i = v_f - at$

$= 35 - 4(5)$

$= \underline{15\ m/s}$

C.

9. B 10. A 11. C (upward = positive)

12. $a = \frac{\Delta v}{\Delta t} = \frac{30-10}{5} = 4\ m/s^2$ C

13. $a = \frac{\Delta v}{\Delta t}$

$t = \frac{\Delta v}{a} = \frac{0-2}{-.2} = 10s$ (total time)

Therefore, the ball started rolling 5 s before 12:00

C

14. $v_i = 0$
$v_f = 6\ m/s$
$a = 0.35$
$d = ?$

$v_f^2 = v_i^2 + 2ad$

$d = \frac{v_f^2 - v_i^2}{2a} = \frac{6^2}{2(.35)} = 51.4\ m$

D

15. $v_i = 4\ m/s$
$d = -8\ m$
$a = -9.8\ m/s^2$
$t = ?$

$d = v_i t + \frac{1}{2} a t^2$

$-8 = 4t + \frac{1}{2}(-9.8)t^2$

$4.9t^2 - 4t - 8 = 0$

$t = \frac{+4 \pm \sqrt{(-4)^2 - 4(4.9)(-8)}}{2(4.9)}$

$t = 1.75\ s$

D

17. B

18. $a = \frac{\Delta v}{\Delta t} = \frac{20}{10} = 2\ m/s^2$

B

19. D

20. $v_i = 0$
$a = 6.3 \times 10^5\ m/s^2$
$t = 8.10 \times 10^{-4}\ s$
$v_f = ?$

$v_f = v_i + at$

$= (6.3 \times 10^5)(8.10 \times 10^{-4})$

$= 510\ m/s$

C

21. A 22. 15 − 20 = −5, A 23. C

24. $v_i = 8.0$ m/s
$v_f = 20.0$ m/s
$a = 3.0$ m/s^2
$t = ?$

$v_f = v_i + at$

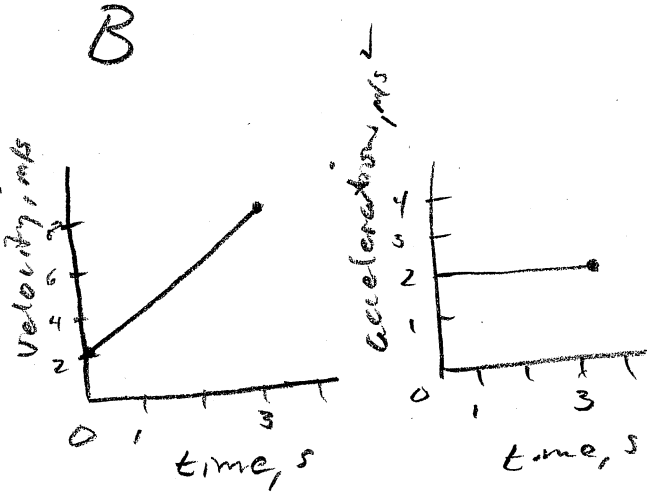
$t = \dfrac{v_f - v_i}{a}$

$= \dfrac{20 - 8}{3}$

$= 4$ s

B

25. A 26. A 27.



A

28. B

29. A

30. car speeds up
$v_i = 0$
$v_f = 21$ m/s
$a = 3.0$ m/s^2
$t = ?$

$v_f = v_i + at$

$t = \dfrac{v_f - v_i}{a} = \dfrac{21}{3} = 7$ s.

30 cont'd

Car slowing down

$v_i = 21$ m/s

$v_f = 0$

$a = -4.0$ m/s^2

$t = ?$

$v_f = v_i + at$

$t = \frac{v_f - v_i}{a}$

$t = \frac{-21}{-4} = 5.25$ s

total time $= 7 + 5.25 = 12.25$ s

D

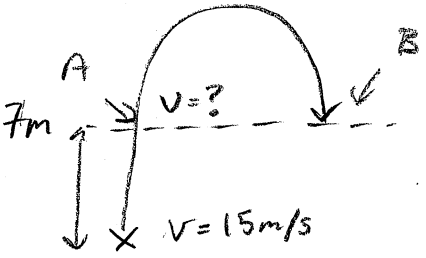
31. A

32. $v_i = 15$ m/s

$d = 7$ m

$a = -9.8$ m/s^2

$v_f = ?$



$v_f^2 = v_i^2 + 2ad$

$= \sqrt{15^2 + 2(-9.8)(7)}$

$v_f = 9.37$ m/s.

from A to B displacement is 0.

$v_i = 9.37$ m/s

$d = 0$

$a = -9.8$ m/s^2

$t = ?$

$d = v_i t + \frac{1}{2} a t^2$

$-v_i t = \frac{1}{2} a t^2$

$t = -\frac{2v_i}{a} = \frac{-2(9.37)}{-9.8} = 1.91$ s

D