p.233 #1, 2, 5, 6 omit f

1. $f(t) = t^3 - 12t^2 + 36t$

a. $v(t) = 3t^2 - 24t + 36$

b. $v(3) = 3(3)^2 - 24(3) + 36 = -9$ ft/sec

c. $v(t) = 0$

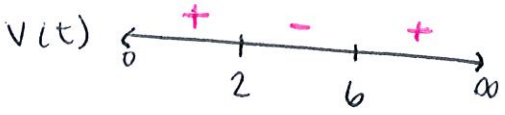
$3t^2 - 24t + 36 = 0$

$3(t^2 - 8t + 12) = 0$

$3(t-6)(t-2) = 0$

$t = 2, 6$ seconds

d.



positive direction: $(0, 2)$ $(6, \infty)$

e. $(f(2) - f(0)) + |f(6) - f(2)| + (f(8) - f(6))$

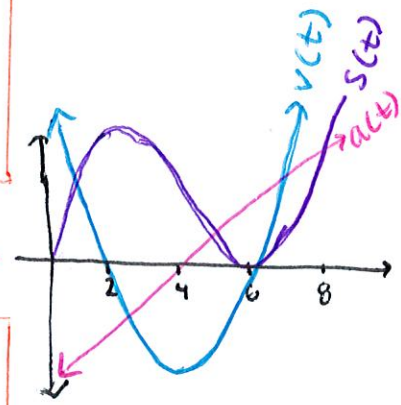
$= (32) + |-32| + (32)$

$= 32 + 32 + 32 = 96$ ft

f. no

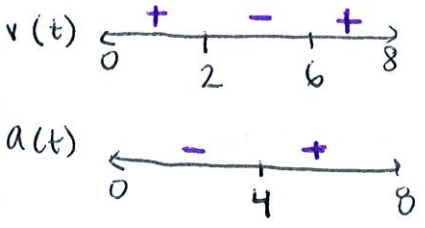
g. $a(t) = 6t - 24$

$a(3) = 6(3) - 24 = -6$ ft/sec^2



h. * that red symbol means use calculator

i. compare



Speeding up: $(2, 4)$ $(6, 8)$

Slowing down: $(0, 2)$ $(4, 6)$

2. $f(t) = 0.01t^4 - 0.04t^3$

a. $v(t) = 0.04t^3 - 0.12t^2$

b. $v(3) = 0.04(3)^3 - 0.12(3)^2 = 0$ ft

c. $v(t) = 0$

$0.04t^4 - 0.12t^3 = 0$

$0.04t^3(t - 3) = 0$

$t = 0, 3$ seconds

d.

positive direction: $(3, \infty)$

e. $|f(3) - f(0)| + (f(8) - f(3))$

$= |0.27| + (20.75)$

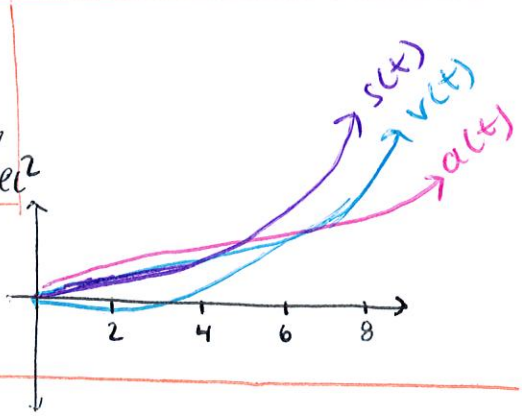
$= 21.02$ ft

f. no

g. $a(t) = 0.12t^2 - 0.24t$

$a(3) = 0.12(3)^2 - 0.24(3) = 0.36$ ft/sec^2

h. * red symbol means use calculator



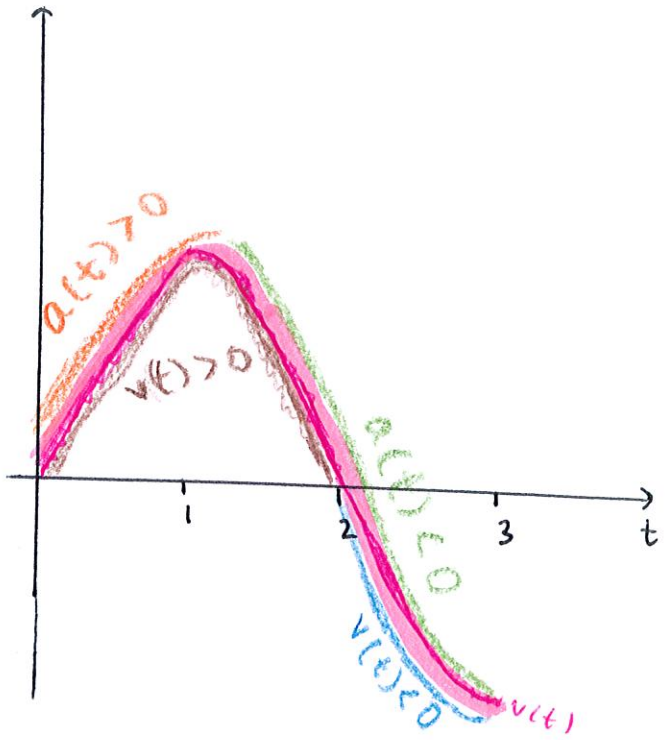
i.

Speeding up:
$(0, 2)$ $(3, 8)$

slowing down:
$(2, 3)$

5. a.

$v(t)$ =



Speeding up:

(0, 1) (2, 3) { where velocity & acceleration are both >0 or both <0

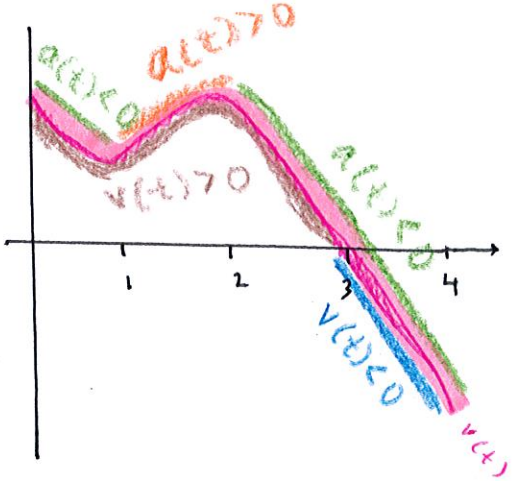
slowing down:

(1, 2) { where velocity & acceleration have different signs

---

b.

$v(t)$ =



speeding up:

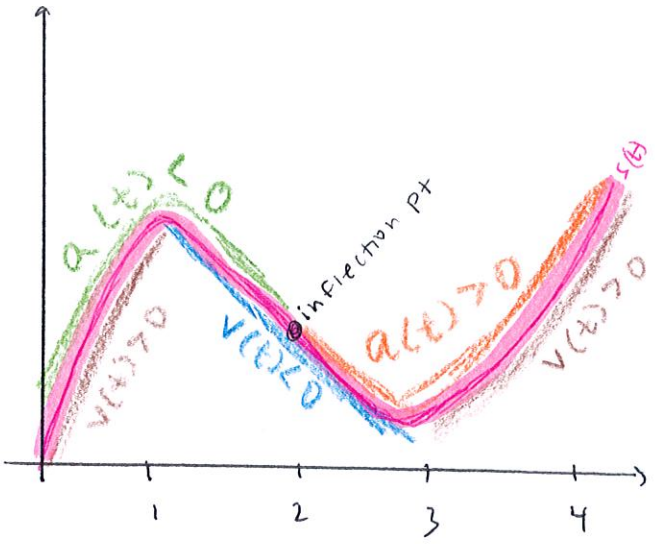
(1, 2) (3, 4) { where velocity & acceleration are both >0 or both <0

slowing down:

(0, 1) (2, 3) { where velocity & acceleration have different signs

6. a.

$s(t)$ =



speeding up:

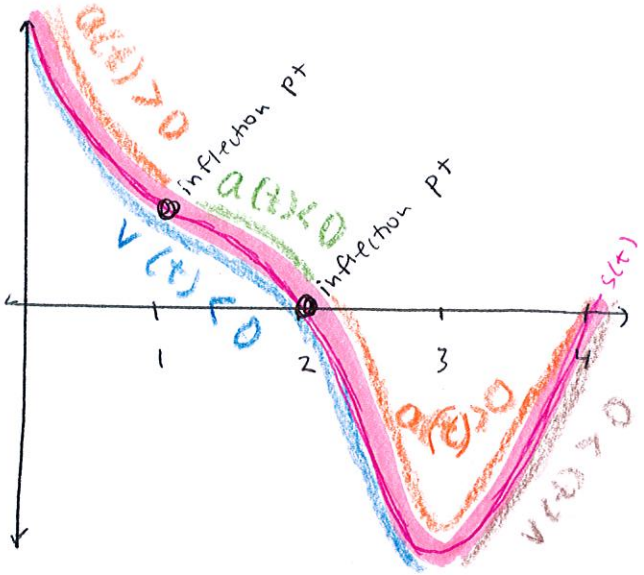
(1, 2) (3, 4) { where velocity & acceleration have same signs

slowing down:

(0, 1) (2, 3) { where velocity & acceleration have different signs

---

b. $s(t)$ =



speeding up:

(1, 2) (3, 4) { where velocity & acceleration have same signs

slowing down:

(0, 1) (2, 3) { where velocity & acceleration have different signs