

2

a) i) $\frac{s(2.5) - s(2)}{2.5 - 2} = -32 \text{ ft/s}$

ii) $\frac{s(2.1) - s(2)}{2.1 - 2} = -25.6 \text{ ft/s}$

iii) $\frac{s(2.05) - s(2)}{2.05 - 2} = -24.8 \text{ ft/s}$

iv) $\frac{s(2.01) - s(2)}{2.01 - 2} = -24.2 \text{ ft/s}$

b) $y' = -32t + 40$

$y'(2) = -32(2) + 40$

$y'(2) = -24 \text{ ft/s}$

As t approaches 2 sec, the avg velocity approaches the instantaneous velocity

$$(4) \quad s = t^2 + t$$

$$a) \quad i) \quad \frac{s(2) - s(0)}{2} = \frac{6 - 0}{2} = 3 \text{ m/s}$$

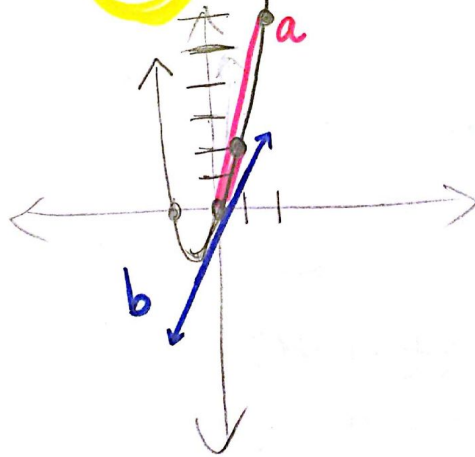
$$ii) \quad \frac{s(1) - s(0)}{1} = \frac{2}{1} = 2 \text{ m/s}$$

$$iii) \quad 1.5 \text{ m/s}$$

$$iv) \quad 1.1 \text{ m/s}$$

$$b) \quad s' = 2t + 1$$
$$s'(0) = 1 \text{ m/s}$$

$$c) \quad s = t^2 + t$$
$$s = t(t+1)$$



(6) a) $s(t) = \frac{1}{2}gt^2 + v_0t + s_0$

$$s(t) = \frac{1}{2}(-32)t^2 + 40t +$$

$$s(t) = -16t^2 + 40t$$

b) $s'(t) = -32t + 40$

$$s'(2) = -32(2) + 40$$

$$s'(2) = -24 \text{ ft/s}$$

$$\textcircled{8} \quad v(t) = 12t^2 + 6$$

$$v(a) = 12a^2 + 6$$

$$v(1) = 12(1)^2 + 6 = 18 \text{ m/s}$$

$$v(2) = 54 \text{ m/s}$$

$$v(3) = 114 \text{ m/s}$$

10 a) $C'(x) = 10 + 0.1x$
b) $C'(100) = 20$

(2)

a) $v(t) = 7 - 2t$

b)

$$7 - 2t < 0$$

$$-2t < -7$$

$$t > 3.5$$

$$(3.5, 10]$$

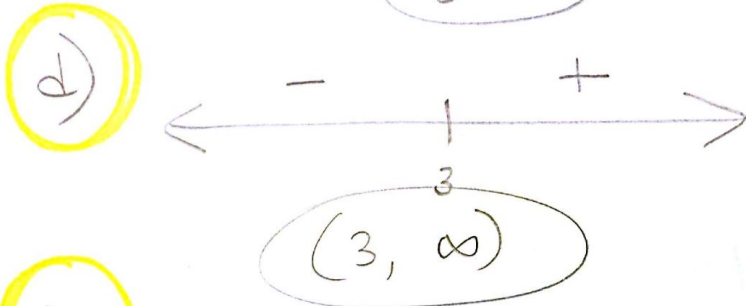
$$v(t) < 0$$

14) a) $v(t) = 2t - 6$

$f(t) = t^2 - 6t + 9$

b) $v(2) = 4 - 6 = -2$

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



e)

t	s(t)	
0	9	> 3 L
1	6	> 5 L
2	1	> 1 L
3	0	> 1 L
4	1	> 1 R
		10