

## Answers to Week 5

### • Section 3.3

1. .

(a)  $v = f'(t) = 3t^2 + 6t - 9$

(b)  $f(3) = 32 \text{ ft}, f'(3) = 36 \text{ ft/sec}$

(c)  $t = -3, t = 1$  seconds

(d) 37ft.

2. .

(a)  $f'(t) = \frac{4 - t^2}{(t^2 + 4)^2}$

(b)  $f(3) = \frac{3}{13} \text{ ft}, f'(3) = -\frac{5}{169} \text{ ft/sec}$

(c)  $t = 2, t = -2$  seconds

(d)  $\frac{7}{26}$  feet

3. .

(a) 6100 cc/cm

(b) 7500 cc/cm

### • Section 3.4

1. .

(a)  $\frac{2}{5}$

(b)  $\frac{7}{3}$

(c)  $-\frac{1}{2}$

2.  $f'(x) = g'(x) = \frac{1}{\cos x + 1}$

3.  $y - \frac{\pi^2}{16} = \left(\frac{\pi}{2} + \frac{\pi^2}{8}\right) \left(x - \frac{\pi}{4}\right)$

4.  $a = 0, \frac{\pi}{3}, \pi, \frac{5\pi}{3}, 2\pi$

5.  $2 \cos^2 x - 2 \sin^2 x = 2 \cos(2x)$