

1) a) 4

b)  $\frac{3}{4}$

c) 0

2) a)  $\frac{\cos(x)}{\sin(x)} e^{\sec(x)} + \ln(\sin(x)) e^{\sec(x)} \sec(x) \tan(x)$

b)  $8 \left( \frac{(x+3)}{(x^2+2)} \right)^8 \left( \frac{1}{x+3} - \frac{2x}{x^2+2} \right)$  OR  $8 \left( \frac{(x+3)}{(x^2+2)} \right)^7 \left[ \frac{(x^2+2) - (x-3)(2x)}{(x^2+2)^2} \right]$

c)  $(\tan(x))^x \left[ \ln(\tan(x)) + \frac{x \sec^2(x)}{\tan(x)} \right]$

3)  $y = \frac{3}{5}x - \frac{14}{5}$

4)  $L(x) = 2 + \frac{1}{12}(x-5), \frac{239}{240}$

5) Incr @ 5 ft<sup>2</sup>/min

6) 6x3x1

7) a) No Horizontal (limit as  $x \rightarrow \pm\infty$  do not exist)

(Oblique Asymptote:  $y=x+1$ )

b)  $x=1$

c) Left:  $-\infty$ , Right:  $+\infty$

d) Incr:  $(-\infty, 0]$ ?  $[2, \infty)$ , Decr:  $[0, 1]$ ?  $(1, 2]$ , Max @  $(0, -1)$ , Min @  $(2, 4)$

e) Up:  $(1, \infty)$ , Down:  $(-\infty, 1)$ , No inflection point

f) graph

8)  $3x^2 \sin(x^6)$

9) a)  $\frac{80}{3}$

b)  $-\frac{\cos^6(x)}{6} + C$

10) graphs