

## Math 124 Quiz #5 Answers

1. (a)  $h'(t) = \frac{7t^3 \sec t \cdot \tan t - (\sec t + 1) \cdot 21t^2}{(7t^3)^2}$  (Using the quotient rule)

(b)  $\frac{dy}{dx} = 4 + e^x(11 \sin x + \frac{1}{x}) + e^x(11 \cos x - \frac{1}{x^2})$  (Using the product rule on  $e^x(11 \sin x + \frac{1}{x})$ .)

2.  $\lim_{x \rightarrow 2\pi} \frac{3 \sin x}{\tan x} = \lim_{x \rightarrow 2\pi} \frac{3 \sin x}{\frac{\sin x}{\cos x}} = \lim_{x \rightarrow 2\pi} 3 \cos x = 3 \cos 2\pi = \boxed{3}$

3.  $\boxed{x = \frac{\pi}{6} \text{ and } x = \frac{5\pi}{6}}$

$(f'(x) = -4 \sin x + 7 \Rightarrow \text{Solve: } -4 \sin x + 7 = 5 \Rightarrow \sin x = \frac{1}{2})$