Homework #4 Final Answers

1. $f'(x) = \cos(3x) \cdot \sec^2(1-x^2)(-2x) + \tan(1-x^2)(-\sin(3x)) \cdot 3$

2. $y' = \frac{1}{2\sqrt{\cos\sqrt{x}}} \cdot (-\sin\sqrt{x}) \cdot \frac{1}{2\sqrt{x}}$

3. $f'(x) = -\sin(\sin(\cos x)) \cdot \cos(\cos x) \cdot (-\sin x)$

4. $f'(x) = 6\left(\frac{\cos(7x)}{\sin(8x)}\right)^5 \cdot \left(\frac{\sin(8x)(-\sin(7x)) \cdot 7 - \cos(7x) \cdot \cos(8x) \cdot 8}{(\sin(8x))^2}\right)$

OR $\sin^2(8x)$

5. $f'(x) = \left(\cos\tan\sqrt{9+x^8}\right) \cdot \sec^2\sqrt{9+x^8} \cdot \frac{1}{2\sqrt{9+x^8}} \cdot (8x^7)$

6. $g''(\pi) = -2$

7. $G'\left(\frac{\pi}{6}\right) = 2\sqrt{3}$

8. $w'\left(\frac{\pi}{6}\right) = 2 - \sqrt{3}$

9. check Formula

10. $\frac{dy}{dx} = \frac{2x - \cos x}{\sec^2 y + 15y^2}$

11. Answer: The angle between the ladder and the wall is increasing at $\frac{1}{\sqrt{84}}$ Radians per Second

Means $\frac{d\theta}{dt} = \frac{1}{\sqrt{84}}$

12. Answer: The angle between the string and the Horizontal is decreasing at a rate of $\frac{1}{10}$ Radians per second.

↖ Means $\frac{d\theta}{dt} = -\frac{1}{10}$