

1. $g'(\theta) = \sec(\theta) \tan(\theta) - \tan(\theta) - \theta \sec^2(\theta)$
2. $f'(x) = -\csc^2(\sec x) \cdot \sec x \tan x$
3. $* y' = \frac{5 \cos(5\theta) \cdot (3 - \cos(5\theta)) - 5 \sin^2(5\theta)}{(3 - \cos(5\theta))^2} = \frac{15 \cos(5\theta) - 5}{(3 - \cos(5\theta))^2}$
4. $* \frac{dy}{dx} = \frac{2 \sec^2 x \tan x - \sec^2 x \cos y + 4x}{y \sin y - \tan x \sin y - \cos y}$
5. $y = -3$
6. $\frac{dy}{dt} = -\frac{2}{5} \text{ m/sec}$
7. $dy = \frac{4}{75}$
8. $\sec\left(\arccos\left(\frac{1}{\sqrt{2}}\right)\right) = \sqrt{2}, \quad \sin\left(\arccos\left(\frac{1}{\sqrt{2}}\right)\right) = \frac{1}{\sqrt{2}}$
9. $y' = \frac{5}{1 + (5x - 3)^2}$
10. $g'(\theta) = \frac{-\sec^2 \theta}{\sqrt{1 - \tan^2 \theta}}$
11. $F(x) = 3x + 2x^2 + 2x^3 - 3x^4 + C$
12. $x_2 \approx .1675$
13. $x = \pm \sqrt{\frac{1 \pm i\sqrt{3}}{2}}$