3.4. 59. $f(x) = 2\sin x + \sin^2 x$

$f'(x) = 2\cos x + 2\sin x \cos x$

$f'(x) = 0$

$-2\cos x = 2\sin x \cos x$

$-1 = \sin x$

$x = -\frac{\pi}{2} + 2k\pi, \quad k \in \mathbb{Z}$

3.4. 76. $y = e^{rx}$

$y' = re^{rx}$

$y'' = r^2 e^{rx}$

$r^2 e^{rx} - 4re^{rx} + e^{rx} = 0$

$r^2 - 4r + 1 = 0$

$r = \frac{4 \pm \sqrt{16-4}}{2} = 2 \pm \frac{1}{2}\sqrt{4 \cdot 3} = 2 \pm \sqrt{3}$

3.5: 20. $\tan(x-y) = \frac{y}{1+x^2}$

$\frac{d}{dx}\tan(x-y) = \frac{d}{dx}\frac{y}{1+x^2}$

$\sec^2(x-y)(1-y') = \frac{d}{dx}\, y(1+x^2)^{-1}$

$= y'(1+x^2)^{-1} + y(-1)(1+x^2)^{-2}(2x) =$

$\sec^2(x-y) - y'\sec^2(x-y)$

$\sec^2(x-y) + y(1+x^2)^{-2}(2x) = y'\left((1+x^2)^{-1} + \sec^2(x-y)\right)$

$$y' = \frac{\sec^2(x-y) + y(1+x^2)^{-2}(2x)}{\sec^2(x-y) + (1+x^2)^{-1}}$$

3.5: 50. $y = \tan^{-1}(x^2)$

$y' = \frac{2x}{1+x^4}$

3.6: 28. $f(x) = \sqrt{2+\ln x}$, $x > 0$ and $2+\ln(x) \geq 0$

$f'(x) = \frac{1}{2}(2+\ln x)^{-\frac{1}{2}}\left(\frac{1}{x}\right)$ $\quad \ln(x) \geq -2$

$= \frac{1}{2}\left(\frac{1}{\sqrt{2+\ln x}}\right)\left(\frac{1}{x}\right)$ $\quad x \geq e^{-2}$

$= \left(2x\sqrt{2+\ln x}\right)^{-1}$

3.6: 30. $f(x) = \ln\ln\ln x$ $\quad f'(x) = \frac{1}{\ln\ln x}\frac{1}{\ln x}\frac{1}{x}$

$x > 0$, $\ln x > 0$, $\ln\ln x > 0$.

$x > 1$. $\ln\ln x > 0$

$e^{\ln\ln x} > e^0$

$\ln x > e^0$

$x > e^e$