1 Section 3.4

1. Let $u = g(x) = 4x$ and then $y = f(u) = \sin u$. Apply by the Chain Rule, $y' = f'(u)u' = \cos u4 = 4\cos x$.

2. Let $u = 4 + 3x$ and then $y = f(u) = u^{\frac{1}{2}}$. Apply by the Chain Rule,$y' = f'(u)u' = \frac{1}{2}u^{\frac{-1}{2}}3 = \frac{3}{2}u^{\frac{-1}{2}}$.

3. Let $u = g(x) = 1 - x^2$ and then $y = f(u) = u^{10}$. Apply by the Chain Rule,$y' = f'(u)u' = 10u^9\dot{(} - 2x) = -20x(1 - x^2)^9$.

5. Let $u = g(x) = \sqrt{x}$ and then $y = f(u) = e^u$. Apply by the Chain Rule, $y' = f'(u)u' = (e^{\sqrt{x}})(\frac{1}{2\sqrt{x}}) = \frac{e^{\sqrt{x}}}{2\sqrt{x}}$.

7.$F'(x) = 7(x^3 + 4x)^6 \frac{d}{dx}(x^3 + 4x) = 7(3x^2 + 4)(x^3 + 4x)^6$.

22. $y' = (-5e^{-5x})\cos 3x + (e^{-5x})(-3\sin 3x) = -5e^{-5x}\cos 3x - 3e^{-5x}\sin 3x$.

56. As $x > 0, y = \frac{x}{\sqrt{2-x^2}}$ and the derivative for y as $x > 0$ is $y' = \frac{\sqrt{2-x^2} - \frac{x^2}{\sqrt{2-x^2}}}{2-x^2}$ and $y'(1) = 0$, so the slope at point $(1, 1)$ is 0 and the tangent line is $y = 1$.

77. Since the displacement of a particle is $s(t) = 10 + \frac{1}{4}\sin(10\pi t)$, then the velocity after t seconds is $v(t) = s'(t) = \frac{1}{4}\cos(10\pi t)10\pi = \frac{5}{2}\pi\cos(10\pi t)$ cm/s.