1.

(a) $f'(x) = 2x - 2$, $f''(x) = \boxed{2}$

(b) $g'(t) = \frac{1}{2}t^{-1/2} + t^{-2}$, $g''(t) = \boxed{-\dfrac{1}{4t^{3/2}} - \dfrac{2}{t^3}}$

2.

(a) $h'(\theta) = \boxed{2\left(\cos^2(\theta) - \sin^2(\theta)\right)}$

(b) $y'(x) = \boxed{\dfrac{1 - x^2}{(x^2 + 1)^2}}$