

§3.6: DERIVATIVES OF INVERSE FUNCTIONS

1.] Differentiate the following functions:

a.) $f(x) = 2 \ln(x) \cos(x)$

b.) $g(x) = \log_2(2x^2 + 5)$

2.] Prove that $\frac{d}{dx} (\arctan(x)) = \frac{1}{1+x^2}$

3.] Differentiate the following functions:

a.) $f(x) = x \arctan(x)$

b.) $g(x) = \sin(\arccos(2x))$

c.) $h(x) = \tan^{-1}\left(\frac{1}{x^2+1}\right)$

d.) $k(x) = \ln(\cos^{-1}(x))$

4.] Find the equation of the tangent line to the curve defined by $f(x) = \arccos(x^2)$ at the point $\left(\frac{1}{\sqrt{2}}, f\left(\frac{1}{\sqrt{2}}\right)\right)$.
Put the final answer in slope-intercept form.