Name_____

Differentiate the following functions.

1. $f(x) = x^2 + \arctan x$
2. $g(t) = \arcsin(2t + 2)$
3. $y = x \arcsin x$
4. $y = \dfrac{1}{\sin^{-1} x}$
5. $f(x) = x \arctan \sqrt{x}$
6. $y = x^2 \arcsin x$
7. $y = \dfrac{1 + \arctan x}{2 - 3\arctan x}$
8. $f(x) = \arcsin(\cos x)$
9. $f(x) = x(\arctan x)^2$
10. $y = \left(\arcsin\left(x^3\right)\right)^4$
11. $y = \arctan\left(e^{-x^2}\right)$
12. $h(x) = \arctan(\ln x)$ Find the tangent line at $x = e$.
13. $y = x \arcsin x + \sqrt{1 - x^2}$
14. $y = \ln(x^2 + 4) - x \arctan\left(\dfrac{x}{2}\right)$ Find the tangent at $x = 2$.
15. $y = \arctan\left(\dfrac{1}{x}\right) - \arctan x$

INVERSE TRIG DERIVATIVES

$$\frac{d}{dx}(\arcsin x) = \frac{1}{\sqrt{1 - x^2}}$$

$$\frac{d}{dx}(\arccos x) = \frac{-1}{\sqrt{1 - x^2}}$$

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