

Name_____

Differentiate the following functions.

1. $f(x) = x^2 + \arctan x$

2. $g(t) = \arcsin(2t + 2)$

3. $y = x \arcsin x$

4. $y = \frac{1}{\sin^{-1} x}$

5. $f(x) = x \arctan \sqrt{x}$

6. $y = x^2 \arcsin x$

7. $y = \frac{1 + \arctan x}{2 - 3 \arctan x}$

8. $f(x) = \arcsin(\cos x)$

9. $f(x) = x(\arctan x)^2$

10. $y = (\arcsin(x^3))^4$

11. $y = \arctan(e^{-x^2})$

12. $h(x) = \arctan(\ln x)$ Find the tangent line at $x = e$.

13. $y = x \arcsin x + \sqrt{1-x^2}$

14. $y = \ln(x^2 + 4) - x \arctan\left(\frac{x}{2}\right)$ Find the tangent at $x = 2$.

15. $y = \arctan\left(\frac{1}{x}\right) - \arctan x$

INVERSE TRIG DERIVATIVES

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

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

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