

Name:

Section: 5 6 9 10

1. Evaluate $\arctan(1)$. $= \frac{\pi}{4}$ since $\tan\left(\frac{\pi}{4}\right) = 1$

2. Find the derivative of $y = \tan^{-1}(\ln x) + \arcsin(\sqrt{x})$.

$$y' = \frac{1}{1 + (\ln x)^2} \cdot \frac{1}{x} + \frac{1}{\sqrt{1 - (\sqrt{x})^2}} \cdot \frac{1}{2} x^{-1/2}$$

3. Evaluate the integral $\int \frac{dx}{4 + x^2}$. $= \int \frac{1/4 dx}{1 + (x/2)^2}$

$$u = \frac{x}{2} \quad dx$$

$$du = \frac{1}{2} dx$$

$$\frac{1}{2} du = \frac{1}{4} dx$$

$$= \int \frac{1/2 du}{1 + u^2}$$

$$= \frac{1}{2} \tan^{-1}(u) + C$$

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