Math 6C, Review Quiz

Mrs. Head  Name:
For problems 1 – 3, find the derivative of $y$ with respect to $x$ or $\theta$, as indicated.

1. $y = \cot^{-1} x - 3 \tan^{-1} x$

2. $y = \ln \left( \frac{e^{\cos^{-1} \theta} \sqrt{\theta^2 + 1}}{\sec h \theta} \right)$

3. $y = x^{4^x}$
In problems 4 – 8, evaluate the integrals.

4. \[ \int_{1}^{2} \frac{5 \ln x}{x} \, dx \]

5. \[ \int \frac{\sqrt{9 - w^2}}{w^2} \, dw \]

6. \[ \int_{0}^{1/2} \theta \cos(\pi \theta) \, d\theta \]
7. \[ \int_{3}^{5} \frac{dx}{x - 3} \]

8. \[ \int_{-1}^{\infty} \frac{7 \, d\theta}{1 + \theta^2} \]

In problem 9, find the limit.

9. \[ \lim_{x \to \infty} \frac{\ln(x + 1)}{\log_2 x} \]
10. Sketch the region in the plane consisting of points whose polar coordinates satisfy
\(-2 \leq r \leq 1\), \(-\pi/6 < \theta < \pi/3\).