## 2.10 Derivatives of $\tan x$, $\cot x$, $\sec x$, and $\csc x$

Calculus Name: _____ **CA #2**

**Find the derivative of each function.**

1. $r = \frac{\sec\theta}{\theta}$

2. $g(x) = \csc x + \ln x$

3. $y = 5x - \cot x$

4. $h(x) = 3x \sec x$

5. $y = \csc x \cos x$

**Find the derivative at the given $x$-value. Show your work!**

6. $f(x) = \sec x$ at $x = \frac{\pi}{4}$.

7. $g(x) = 3\csc x$ at $x = -\frac{\pi}{6}$.

**Estimate the derivative at the given $x$-value by using a calculator.**

8. $h(x) = -2\sec x^3$ at $x = 3$.

9. $f(x) = \tan^2(3x)$ at $x = -2$.

Answers to 2.10 CA #2

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|---|---|---|---|---|
| 1. $\frac{\theta\sec\theta\tan\theta - \sec\theta}{\theta^2}$ | 2. $-\csc x\cot x + \frac{1}{x}$ | 3. $5 + \csc^2 x$ | 4. $3\sec x + 3x\sec x\tan x$ | |
| 5. $-\cot^2 x - 1$ | 6. $\sqrt{2}$ | 7. $-6\sqrt{3}$ | 8. $-610.223$ | 9. $1.8939$ |