Math 141 Worksheet 7

Show all work for full credit.

1. Find the derivative $f'(x)$.

$$f(x) = 5^{\cos^3(x)\ln x}$$

2. Find the derivative $f'(x)$.

$$f(x) = e^{\sqrt{2x^5+x-1}}$$

3. Find the derivative $f'(x)$.

$$f(x) = \ln(\cot^2 x) + 3^{\sec(x^2)}$$

4. Find the derivative $f'(x)$.

$$f(x) = x^4 \tan^{-1}(5x^2)$$

5. Find the derivative $f'(x)$.

$$f(x) = 2^{5x} \cos^{-1}(x^3)$$

6. Find the derivative $f'(x)$.

$$f(x) = \sqrt[4]{\csc(7x^2) + \ln(5x^3)}$$

7. Find the derivative $f'(x)$ using logarithmic differentiation.

$$f(x) = (\tan x)^{\sin(3x)}$$

8. Evaluate the limit.

$$\lim_{x \to 0} \frac{\tan x - x}{x^3}$$

9. Evaluate the limit.

$$\lim_{x \to 1} \frac{1 - x + \ln x}{1 + \cos(\pi x)}$$

10. Evaluate the limit.

$$\lim_{x \to 0} \frac{\sin(5x) - 5 \sin x}{x^3}$$

11. Evaluate the limit.

$$\lim_{x\to 0}(e^x + x)^{1/x}$$

12. Evaluate the limit.

$$\lim_{x\to 0}\left(\frac{1}{x^2}\right)^x$$

13. Evaluate the limit.

$$\lim_{x\to +\infty}(2e^x + 3x)^{5/x}$$