

Name: \_\_\_\_\_

Section: \_\_\_\_\_

**Math 112**  
Spring 2004  
Derivative Skills Test - First Attempt  
Version 1

**Derivative Rules:**

$$(f(x) + g(x))' = f'(x) + g'(x) \quad (c \cdot f(x))' = c \cdot f'(x)$$

$$(e^{f(x)})' = e^{f(x)} \cdot f'(x)$$

$$(f(x) \cdot g(x))' = f(x)g'(x) + g(x)f'(x)$$

$$(f(x)^n)' = n f(x)^{n-1} \cdot f'(x)$$

$$(\ln(f(x)))' = \frac{1}{f(x)} \cdot f'(x) = \frac{f'(x)}{f(x)}$$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{g(x)f'(x) - f(x)g'(x)}{(g(x))^2}$$

Compute the derivative. Do not simplify.

1.  $y = 6x^4 - 7x^3 + 2x + \sqrt{2}$

2.  $y = x^3 - \frac{1}{3x^5} + 2\sqrt{x} - \frac{3}{x}$

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

4.  $y = (x^3 + 2x - 7)(3 + x - x^2)$

5.  $y = (3x + 1)\sqrt{6x + 5}$

6.  $y = (1 - 3e^x)^4$

7.  $y = x^2 \ln(\sqrt[3]{x})$

8.  $y = \frac{e^x + e^{-x}}{e^x - e^{-x}}$

9.  $y = xe^{(x^2-4x+1)}$

10.  $y = \left(\frac{x+2}{2-\ln x}\right)^3$