

Coastal Carolina University  
Math 160 - Derivative Mastery Test

Fall 2016

Name \_\_\_\_\_

Find the derivative of each of the following functions. The final answer (and only the final answer) must be put on the answer line. You do not need to simplify your answer.

(1)  $f(x) = e^x + x^7 - \ln(x) + \sqrt{2}$

Ans:  $f'(x) = e^x + 7x^6 - \frac{1}{x}$

(2)  $f(x) = \frac{1}{x} - \sqrt[3]{x} + \pi^2$

Ans:  $f'(x) = -\frac{1}{x^2} - \frac{1}{3}x^{-4/3}$

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

Ans:  $f'(x) = (-2x^{-3} - 3x^2) \cos x - (x^{-2} - x^3) \sin x$

(4)  $f(x) = \csc(x) + \arcsin(x)$

Ans:  $f'(x) = -\csc x \cot x + \frac{1}{\sqrt{1-x^2}}$

(5)  $f(x) = \frac{3 - 2x^3}{x^3 + 2x^4}$

Ans:  $f'(x) = \frac{-6x^2(x^3 + 2x^4) - (3 - 2x^3)(3x^2 + 8x^3)}{(x^3 + 2x^4)^2}$

$$(6) f(x) = \sin(x^2 + 4x) + e^{-x}$$

$$\text{Ans: } \underline{f'(x) = \cos(x^2 + 4x) \cdot (2x + 4) - e^{-x}}$$

$$(7) f(x) = \sec(x) \tan(x) + \log_3(x)$$

$$f'(x) = \sec x \tan x \cdot \tan x + \sec x \cdot \sec^2 x + \frac{1}{x \ln 3}$$

$$\text{Ans: } \underline{f'(x) = \sec x \tan^2 x + \sec^3 x + \frac{1}{x \ln 3}}$$

$$(8) f(x) = (5x + 3x^2)^5$$

$$\text{Ans: } \underline{f'(x) = 5(5x + 3x^2)^4 \cdot (5 + 6x)}$$

$$(9) f(x) = \tan^2(x) - 5^{2x}$$

$$f'(x) = 2 \tan x \cdot \sec^2 x - 5^{2x} \ln(5) \cdot 2$$

$$\text{Ans: } \underline{f'(x) = 2 \tan x \sec^2 x - 2 \ln(5) \cdot 5^{2x}}$$

$$(10) f(x) = e^{(x^2+3x)} \cos(x)$$

$$\text{Ans: } \underline{f'(x) = e^{(x^2+3x)} \cdot (2x+3) \cos x - e^{(x^2+3x)} \sin x}$$