

**Derivatives of Functions Containing Logarithms**

2012 - 2013 Fall Semester MATH 1350 (Barsamian) Class Drill  
(based on Section 4-2 Example 2 and Example 3 and suggested exercise 4-2#19)

(A) Let  $f(x) = 12 \ln\left(\frac{13}{x}\right)$ . Find  $f'(x)$ . Hint: Start by rewriting  $f$  using a rule of logarithms.

(B) Let  $f(x) = 12 \ln(x^{13})$ . Find  $f'(x)$ . Hint: Start by rewriting  $f$  using a rule of logarithms.

(C) Let  $f(x) = 12x \ln(13)$ . Find  $f'(x)$ .

Question (D) is on back. →

(D)The goal is to find the equation of the line tangent to the graph of the function

$$f(x) = 5 + \ln(x^3)$$

at the point where  $x = e^2$ .

Remember that the approach is to build the general form of the equation for the tangent line (in point-slope form):

$$(y - f(a)) = f'(a) \cdot (x - a)$$

### **Part I Get Parts**

Identify the number  $a$ .

Find  $f(a)$ .

Find  $f'(x)$ . Hint: Start by rewriting  $f$  using a rule of logarithms.

Find  $f'(a)$ .

### **Part II Substitute Parts Into the Equation**

Substitute the parts that you have found into the tangent line equation. Then convert your equation to slope intercept form.