



CALCULUS I  
FALL 2015

WRITTEN ASSIGNMENT 15  
DUE OCTOBER 23

**Exercise 1.** Use the Second Derivative Test to classify the critical numbers of the function

$$f(x) = \frac{3x - 4}{x^2 + 1}.$$

**Exercise 2.** Use the Second Derivative Test to classify the critical numbers of the function

$$f(x) = x^2 e^{-x}.$$

**Exercise 3.** A paper cup has the shape of a cone with height 10 cm and radius 3 cm (at the top). If water is poured into the cup at a rate of  $2 \text{ cm}^3/\text{s}$ , how fast is the water level rising when the water is 5 cm deep?