

## Quiz 05

Math 140: Calculus I  
Week 5

**Instructions.** No notes, books, or calculators. Show all work clearly. Answers without supporting work may receive little or no credit.

1. Differentiate:

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

2. Compute the second derivative of:

$$g(x) = x^2 \cos(x).$$

3. Differentiate:

$$y = \sin(3x^2) - 4 \cos(x).$$

4. Use implicit differentiation to find  $\frac{dy}{dx}$ :

$$x^2 + xy = 4.$$