

## Practice Quiz No. 3

Show all of your work, label your answers clearly, and do not use a calculator.

**Problem 1** State the following rules for derivatives:

**a** *The constant rule*

**b** *The constant multiple rule*

**c** *The sum rule*

**d** *The product rule*

**e** *The power rule*

**f** *The quotient rule*

**Problem 2** Prove the constant rule.

**Problem 3** Prove the constant multiple rule.

**Problem 4** Prove the sum rule.

**Problem 5** Find the derivative of the following function, remembering to show all of your work:

$$f(x) = 4x^3 - 5x^2 + 2x + 10$$

**Problem 6** Find the derivative of the following function, remembering to show all of your work:

$$f(x) = e^x(x^5 + \sqrt{x})$$

**Problem 7** Find the derivative of the following function, remembering to show all of your work:

$$f(x) = \frac{-x^{1/2}}{e^x + 2x}$$

**Problem 8** Find the derivative of the following function, remembering to show all of your work:

$$f(x) = e^x + x^e$$