

## MATH 234: HOMEWORK 5

DUE: FRIDAY, JULY 8 VIA ILLINOIS COMPASS

1. What is the slope of the curve of  $y = e^x$  at  $x = 0$ ?
2. Simplify  $\frac{e^2 \cdot 2 \cdot e^3 \cdot 5}{e^2}$ .
3. Differentiate  $\frac{e^{x-1}}{e^{x+1}}$  with respect to  $x$ .
4. Differentiate  $e^{3x}$  with respect to  $x$ .
5. Which of the following properties are true of the graph of  $y = 10e^{2x}$ ?
  - (A) It is concave up.
  - (B) The  $y$ -intercept is  $(0, 2)$ .
  - (C) It has a minimum at  $x = 0$ .
  - (D)  $y$  is positive for  $x \geq 0$  and negative for  $x < 0$ .
6. Find the values of  $x$  where  $f(x) = e^{-2x} + 2x$  has a possible relative maximum or minimum point.
7. Which of the following functions satisfy the differential equation  $y'(x) = -8y(x)$ ?
  - (A)  $y(x) = -e^{-8x}$ .
  - (B)  $y(x) = e^{-4x} + 3$ .
  - (C)  $y(x) = 5e^{-4x}$ .
  - (D)  $y(x) = 6e^{-8x}$ .
8. Which of the following functions  $f(x)$  satisfy  $f'(x) = 32f(x)$  and  $f(0) = 1/2$ ?
  - (A)  $f(x) = 32e^{x/2}$ .
  - (B)  $f(x) = e^{16x}$ .
  - (C)  $f(x) = (1/2)e^{32x}$ .
  - (D)  $f(x) = (1/2)x^{32}$ .