Homework 5, Graded Problems

Part I. (1 pt. ea.) Differentiate each of the following. You should be able to do these without looking at your book or any notes. You should be able to do these as fast as you can write the answers down.

1. \( y = x \)
2. \( y = x^2 \)
3. \( y = 3x^3 \)
4. \( y = \frac{1}{x} \)
5. \( y = \frac{1}{\sqrt{x}} \)
6. \( y = x^{-3/4} \)
7. \( y = xe^x \)
8. \( y = e^x \)
9. \( y = e^2 \)
10. \( y = xe^2 \)

Part II. (5 pts. ea.) Differentiate each of the following. By the time you take Exam 2, you should be able to do problems like these as fast as you can write down the answers.

16. \( y = e^x \left( x^3 + \frac{1}{x} \right) \)
17. \( y = \frac{3x + 5}{6x + 2} \)
18. \( y = \frac{ax + b}{cx + d} \), assuming \( a, b, c \) and \( d \) are constants.
19. \( y = \frac{e^x}{1 + x} \)
20. \( y = \frac{xe^x}{1 + x^2} \)