Math 2551 (L1-L3)
01/11/2016

Worksheet 1 - Review

1. Find all the values of x where the tangent lines to $y = \frac{x^3}{3} + 5x$ and $y = 3x^2$ are parallel.
2. Given that $f'(x) = 2e^x - 3$, and that $f(0) = 7$, find $f(x)$.
3. Find $\frac{dy}{dx}$ for $y = x^{3x}$.
4. For what value of c is the function below continuous on $(-\infty, \infty)$?

$$f(x) = \begin{cases} cx + 4 & \text{, if } \quad x < 1 \\ x^2 + 2c & \text{, if } \quad x \geq 1 \end{cases}$$

5. Find the derivative of $f(x) = \arctan(\sin(x))$.
6. Find the derivative of $f(x) = 3^{x^2-3x+4}$.
7. Find the integral:

$$\int_1^{e^4} \frac{1}{2x\sqrt{\ln(x)}} dx$$

8. Find the integral:

$$\int \frac{x-2}{x^2-6x+10} dx$$

9. Find the integral:

$$\int x^6 \ln(x) dx$$

10. Find the integral:

$$\int \pi e^{25} dx$$

11. Find the integral:

$$\int \frac{\sin^3(x)}{\cos(x)} dx$$

12. Find the integral:

$$\int \arctan(x) dx$$

13. Find the integral:

$$\int \frac{1}{2\sqrt{x+1} + x\sqrt{x+1}} dx$$

14. Find the integral:

$$\int \cos(\sqrt{x}) dx$$