Worksheet 1

Dr. M. P. M. M. M^cLoughlin

Spring of 2016

1. Instructions

Let $U = \mathbb{R}$ for the line and let $U = \mathbb{R} \times \mathbb{R}$ for the plane.

You may **not use calculators, computers, etc. No help from any person other than yourself and from any notes other than your own.** You may use other books: from the library, from a professor, etc. **Use pencil only.** All the necessary & sufficient steps for a solution should be shown - further, justification for each step should be provided. **Please SIMPLIFY or USEFULFY**[1] **a result.**

If an answer does not exist write D.N.E. (Does Not Exist) and explain *why* it does not exist.

2. Antiderivatives

1. Find $\int (x^2 \cdot \sin(x^3))dx$.

2. Find $\int (x^{\frac{5}{2}} \cdot (x^2+3)^3)dx$.

3. Find $\int (x^{\frac{5}{2}} \cdot (x^2+3)^8)dx$.

4. Find $\int (x^{\frac{5}{2}} \cdot \sqrt{(x^2+3)})dx$.

5. Find $\int (e^{x^2})dx$.

6. Find $\int (e^x)^2 dx$.

7. Find $\int x(e^{x^2})dx$.

8. Find $\int (\sin^2(x)\cos(x))dx$.

3. Area

9. Find the area of the region bounded by $y = x^2 + 1$, $x = 1, x = 3, y = 0$.

10. Find the area of the region bounded by $y = coshx$, $x = 1, x = 3, y = 0$.

11. Find the area of the region bounded by $y = e^{(x^2)}$, $x = 1, x = 3, y = 0$.

[1] Completely factored form.