

University of Lethbridge
Department of Mathematics and Computer Science
MATH 2565 - Tutorial #7: A Review!
Thursday, March 1

First Name: _____

Last Name: _____

Additional practice (don't include your solutions here):

1. Evaluate the indefinite integral:

(a) $\int x \sec^2(x) dx$

(c) $\int \frac{8}{\sqrt{x^2 + 2}} dx$

(b) $\int \tan^5(x) \sec^4(x) dx$

(d) $\int \frac{2x + 1}{x^3 + x} dx$

2. Evaluate the improper integral, or explain why it doesn't exist:

(a) $\int_{-\infty}^{\infty} \frac{x}{1 + x^2} dx$

(b) $\int_1^{\infty} \frac{\ln x}{x^2} dx$

3. Find the volume of the solid of revolution:

(a) Generated by revolving the region bounded by $y = x^2 - 2x + 2$ and $y = 2x - 1$ about the x -axis.

(b) Generated by revolving the triangle with vertices $(1, 1)$, $(1, 2)$, and $(2, 1)$ about the y -axis.

4. Find the length of the curve $y = 2x^{3/2} - \frac{1}{\sqrt{6}}\sqrt{x}$, for $0 \leq x \leq 9$.

1. Evaluate the indefinite integral:

(a) $\int e^{\sqrt{x}} dx$ (Hint: try a substitution first.)

(b) $\int \cos(x) \cos(2x) dx$

(c) $\int \frac{\sqrt{5-x^2}}{x^2} dx$

(d) $\int \frac{16x^2 - 2x}{(x+3)(2x-1)(x-1)} dx$

2. Evaluate the improper integral, or explain why it does not exist:

(a) $\int_0^{\infty} e^{4-3x} dx$

(b) $\int_{-\infty}^{\infty} \frac{1}{4+x^2} dx$

First set up each of the integrals in problems 3 - 5. Evaluate them if you have time left at the end.

3. Find the area between the curves $y = \sqrt{x}$, $y = -2x + 3$, and $y = -\frac{1}{2}x$.

4. Find the volume of the solid of revolution:

(a) Generated by revolving the region bounded by $y = x^2 - 2x + 2$ and $y = 2x - 1$ about the line $y = 1$.

(b) Generated by revolving the triangle with vertices $(1, 1)$, $(1, 2)$, and $(2, 1)$ about the x -axis.

5. Find the area of the surface generated by revolving the the curve $y = x^2$, for $0 \leq x \leq 1$, about the y -axis.