

MATH 1591 - Review of Chapter 4

1 Main Topics

1. Definitions of antiderivatives, indefinite integrals and definite integrals.
2. Riemann Sum.
3. The integral mean value theorem
4. properties of integrals
5. Fundamental theorem: $\int_a^b f(x)dx = F(b) - F(a)$ and $\frac{d}{dx} \left(\int_a^{g(x)} f(t)dt \right) = f(g(x))g'(x)$
6. Calculation of indefinite or definite integrals
 - (a) rewriting integrands;
 - (b) change of variables $u = g(x)$;
 - (c) use trigonometric identities;
 - (d) use the long division;
7. how to use definite integrals to find areas

2 Review Exercises

Review Exercises of Chapter 4 (page 427): All odd numbers from 1 to 27, from 41 to 59.

3 Self-test

Please work on the following problems and then grade them yourself.

Problems from Review Exercises of Chapter 4 (page 427): 4, 8, 10, 15, 18, 19, 41, 48, 52, 58, 60.

Extra Credit Problems: Evaluate

$$\int \cos^3 x \sin^4 x dx, \quad \int_0^2 \sqrt{4-x^2} dx.$$