Math 199 CD3 Merit Worksheet 5: More Integration Technique

February 4, 2022

1. $$\int \frac{xdx}{x^4+9}$$

2. $$\int \frac{2xdx}{\sqrt{6x-x^2}}$$

3. $$\int \frac{\cos xdx}{5+\sin^2 x}$$

1 Calculation with FTOC (What is this?)

Calculate the following integral:

4.
$$\int_a^b \frac{d}{dx}\left(\frac{180+\sin(3\pi x^2)}{90+\cos(3\pi x^2)}\right)dx$$

2 FTOC

For the following problem, Find the value of x so that the function obtain absolute maximum/minimum value.

5.
$$g(x)=\int_3^{9x^2+5x-19}\frac{1}{3t^3+6t^2+8t+1}dt$$

6.
$$g(x)=\int_5^{7x^2+15x-25}e^{3t^3+9t^2+8t+1}dt$$

7.

$$g(x) = \int_7^{12x^2+5x-23} e^{3t^3+6t^2+25} dt$$

2.1 Integration by Part

8.

$$\int xe^{3x} dx$$

9.

$$\int 5x \arctan 7x dx$$

3 Trig Integral and Trig Sub

(a)

$$\int \sec^n x$$

(b)

$$\int tan^4 x \sec x$$

(c)

$$\int tan^3 x \sec^3 x$$

(d)

$$\int 7sin^2 x dx$$