

Math 1431
Section 16679

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Office Hours: Tuesdays & Thursdays 11:45-12:45
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Questions?

Section 6.3 -Basic Integration Rules

Recall: $\int_a^b f(x)dx = F(b) - F(a)$

① $\int_1^4 \sqrt{x}dx$

② $\int_1^9 \frac{x^2 - 3x + 2}{\sqrt{x}}dx$

Section 6.3 -Basic Integration Rules

3 Find k if $\int_0^2 (2x^3 - kx^2 + 2k)dx = 12$

Section 6.3 -Basic Integration Rules

1 Find $\int_0^{\pi/4} 3 \sec^2(x) dx$

Popper 21 (EMCF)

$$\textcircled{1} \int_1^2 \left(\frac{5}{x^3} + 2x \right) dx =$$

Section 6.3 -Basic Integration Rules

Indefinite Integrals

$\int f(x)dx$ = the general antiderivative of f . Otherwise known as the integral of f .

$\int f(x)dx = F(x) + C$ where C is an arbitrary constant and $F(x)$ is the antiderivative of $f(x)$.

The indefinite integral is a family of functions.

The definite integral is a value.

Section 6.3 -Basic Integration Rules

Some Indefinite Integrals

$$\int x^p dx = \frac{x^{p+1}}{p+1} + C, \quad p \neq -1$$

$$\int \frac{1}{x} dx = \ln|x| + C$$

$$\int e^x dx = e^x + C$$

$$\int \frac{1}{1+x^2} dx = \arctan(x) + C$$

$$\int \frac{1}{\sqrt{1-x^2}} dx = \arcsin(x) + C$$

$$\int \cosh(x) dx = \sinh(x) + C$$

$$\int \sinh(x) dx = \cosh(x) + C$$

Section 6.3 -Basic Integration Rules

$$\int \sin(x) dx = -\cos(x) + C$$

$$\int \cos(x) dx = \sin(x) + C$$

$$\int \sec^2(x) dx = \tan(x) + C$$

$$\int \csc^2(x) dx = -\cot(x) + C$$

$$\int \sec(x) \tan(x) dx = \sec(x) + C$$

$$\int \csc(x) \cot(x) dx = -\cot(x) + C$$

Section 6.3 -Basic Integration Rules

Examples:

$$\textcircled{1} \int 3x dx =$$

$$\textcircled{2} \int \sqrt{x} dx =$$

$$\textcircled{3} \int dx =$$

Section 6.3 -Basic Integration Rules

$$\textcircled{4} \int \frac{x+1}{x} dx =$$

$$\textcircled{5} \int \cos(x) - x^{1/3} dx =$$

$$\textcircled{6} \int e^x + x^2 - \frac{1}{x^2+1} dx =$$

Section 6.3 -Basic Integration Rules

Find $f(x)$ given that $f'(x) = 6x^2 + 4x$ and $f(2) = 10$.

Section 6.3 -Basic Integration Rules

Find $f(x)$ given that $f''(x) = x + 2$, $f'(0) = 3$ and $f(0) = -1$.

Popper 21 (EMCF)

- 2 Suppose that f is continuous and $\int_{-2}^x f(t)dt = \cos(2x) + 1$. Find $f(x)$.

Popper 21 (EMCF)

8 Find $f(x)$ if $x^3 + 2x^4 = \int_1^x \frac{f(t)}{t} dt$

Popper 21 (EMCF)

$$\textcircled{1} \int (1-x)(2+x) dx =$$

?

"Dad! why my sister's named after mom's email id password?"

"Because your mom always forgets her password"

"Thanks Dad"

"No problem +c"



Popper 21 (EMCF)

Given $\int_2^6 f(x)dx = 10$ and $\int_2^6 g(x)dx = -2$, find:

5. $\int_2^6 f(x) + g(x)dx$ 6. $\int_2^6 g(x) - f(x)dx$ 7. $\int_2^6 2g(x)dx$

To Do

Read sections 6.1-6.3.

Work quizzes 22, 23 and 24.

Email me questions to put in the notes.