

CALCULUS

Write your
questions here!

DEFINITE INTEGRAL

$$\int_0^1 t^2(t^3 + 1)^2 dt$$

CHANGE OF BOUNDARIES

Evaluate the definite integrals using u substitution.

$$\int_0^{\frac{\pi}{2}} \cos(x)\sqrt{\sin(x)} dx$$

Evaluate the definite integrals using u substitution.

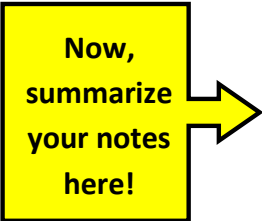
$$\int_0^e \frac{x}{x^2 + 4} dx$$

Evaluate the indefinite integrals using u substitution. SPECIAL CASE

$$\int \frac{x}{\sqrt{x+1}} dx$$

SUMMARY:

Now,
summarize
your notes
here!



10.3 u Substitution Definite Integrals

PRACTICE

Evaluate the definite integral.

1. $\int_1^2 \sqrt{5x-1} dx$

2. $\int_0^{\frac{\pi}{2}} \sin(2x) dx$

Evaluate the definite integral.

$$3. \int_0^1 e^x(4 - e^x)dx$$

$$4. \int_0^1 \frac{x}{(x^2 + 1)^3} dx$$

$$5. \int_{-2}^3 \frac{1}{1+9t^2} dt$$

$$6. \int_0^1 x\sqrt{1-x^2} dx$$

Evaluate the definite integral.

$$7. \int_3^6 \left(\frac{x^2 - 2x}{x} \right) dx$$

$$8. \int_{-\frac{\pi}{4}}^0 \tan x \sec^2 x dx$$

$$9. \int_0^{\frac{\pi}{8}} \sec(2x) \tan(2x) dx$$

$$10. \int_1^e \frac{\ln x}{x} dx$$

Evaluate the definite integral.

$$11. \int_3^{\sqrt{30}} \frac{2x}{\sqrt{x^2 - 5}} dx$$

$$12. \int_0^1 \frac{x^2 + 2x}{\sqrt[3]{x^3 + 3x^2 + 4}} dx$$

$$13. \int_0^{\pi} (2 \sin x + \sin 2x) dx$$

$$14. \int_0^4 \frac{x}{\sqrt{2x+1}} dx$$

MULTIPLE CHOICE

1. Evaluate $\int_{-1}^2 (3x^2 - 4x + 2)dx$.
- (A) -2
(B) 14
(C) 9
(D) 18
(E) 21
2. An equivalent representation of the definite integral $\int_1^3 2x \cos(x^2)dx$ is
- (A) $\int_1^3 \cos u \, du$
(B) $\int_1^9 \cos u \, du$
(C) $\int_1^{\sqrt{3}} \cos u \, du$
(D) $\int_1^9 2\sqrt{u} \cos u \, du$
(E) $\int_1^{\sqrt{3}} 2\sqrt{u} \cos u \, du$

FREE RESPONSE

Your score: _____ out of 9 points

1. The function f is defined by $f(x) = \sqrt{25 - x^2}$ for $-5 \leq x \leq 5$.
- (a) Find $f'(x)$.
- (b) Write an equation for the line tangent to the graph of f at $x = -3$.
- (c) Let g be the function defined by $g(x) = \begin{cases} f(x) & \text{for } -5 \leq x \leq -3 \\ x + 7 & \text{for } -3 < x \leq 5 \end{cases}$
Is g continuous at $x = -3$? Use the definition of continuity to explain your answer.
- (d) Find the value of $\int_0^5 x\sqrt{25 - x^2} \, dx$.