31 Lecture - MTH101

Important Mcqs

What is the correct substitution fo	r evaluating the	definite integral of	of $(\cos(x)\sin(x))$	dx from 0	to ?/2?

- a) u = cos(x)
- b) $u = \sin(x)$
- c) u = cos(x)sin(x)
- d) $u = ?(1-\cos^2(x))$

Answer: b) $u = \sin(x)$

Explanation: Using the substitution $u = \sin(x)$, we get $du/dx = \cos(x) dx$. Substituting this into the integral and using the limits of integration, we get $\cos(x)\sin(x) dx$ from 0 to 2 is equal to 2 udu from 0 to 1, which evaluates to 1/2.

What is the correct substitution for evaluating the definite integral of $?x^2 + 1$ dx from 0 to 1?

- a) u = x + 1
- b) $u = x^2$
- c) $u = \operatorname{sqrt}(x+1)$
- d) u = x + 1/2

Answer: a) u = x+1

Explanation: Using the substitution u = x+1, we get du/dx = 1 dx. Substituting this into the integral and using the limits of integration, we get $?x^2 \operatorname{sqrt}(x+1) dx$ from 0 to 1 is equal to $?(u-1)^2 \operatorname{sqrt}(u) du$ from 1 to 2, which can be evaluated using integration by parts.

What is the correct substitution for evaluating the definite integral of ?sec(x)tan(x) dx from 0 to ?/4?

- a) u = sec(x)
- b) u = tan(x)
- c) u = sec(x)tan(x)
- d) $u = \sin(x)/\cos(x)$

Answer: a) u = sec(x)

Explanation: Using the substitution $u = \sec(x)$, we get $du/dx = \sec(x)\tan(x) dx$. Substituting this into the integral and using the limits of integration, we get $(\sec(x)\tan(x)) dx$ from 0 to (2 + 1) to 1, which evaluates to (2 + 1).

What is the correct substitution for evaluating the definite integral of $?x^3e^(x^4+1) dx$ from 0 to 1?

- a) $u = x^4 + 1$
- b) $u = e^{(x^4+1)}$
- c) $u = x^3$
- d) $u = e^x$

Answer: a) $u = x^4+1$

Explanation: Using the substitution $u = x^4+1$, we get $du/dx = 4x^3 dx$. Substituting this into the integral and using the limits of integration, we get $2x^3e^(x^4+1) dx$ from 0 to 1 is equal to $1/4e^u$ du from 1 to 2, which evaluates to $1/4e^u$

What is the correct substitution for evaluating the definite integral of $?(x+1)\cos(x^2+2x+1)$ dx from 0 to 1?

- a) $u = x^2 + 2x + 1$
- b) $u = \cos(x^2 + 2x + 1)$
- c) u = x+1
- $d) u = \sin(x^2 + 2x + 1)$

Answer: a) $u = x^2 + 2x + 1$

Explanation: Using the substitution $u = x^2 + 2x + 1$, we