31 Lecture - MTH101

Important Mcqs

What is the correct substitution for evaluating the definite integral 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 ?u du from 0 to 1, which evaluates to 1/2.

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

a) u = x+1

b) u = x^2

c) u = 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^2sqrt(x+1) dx from 0 to 1 is equal to ?(u-1)^2 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 ?/4 is equal to ?u du from ?2 to 1, which evaluates to ln(?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 ?x^3e^(x^4+1) dx from 0 to 1 is equal to (1/4)?e^u du from 1 to 2, which evaluates to (e^2 - e)/4.

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