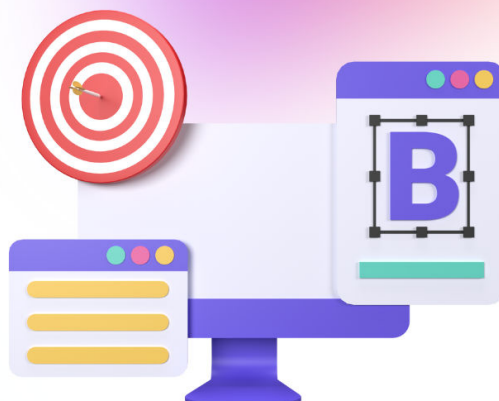


INTEGRATION BY PARTS

Integration is one of the most important ways in calculation, as it allows us to find the area under the wind, the volume of a solid, the work done by a force, and multitudinous other operations. In

this composition, we will explore two important styles of integration: integration by parts and the integral product rule.

These styles are useful for integrating the product of two functions, which are constantly encountered in mathematics and wisdom.

[Read more](#)

Q1: What is the integral of the exponential function 'e^x'?

- A: $e^x(x + C)$
 - B: $1/(e^x + C)$
 - C: $e(x^2 + C)$
 - D: x^2
-

Q2: In Integration by Parts, which term in the formula usually undergoes differentiation?

- A: $\int u \, dv$
 - B: uv
 - C: $\int v \, du$
 - D: u
-

Q3: Which of the following functions involves 'e' in integration?

- A: $\int x^2 \, dx$
 - B: $\int \sin(x) \, dx$
 - C: $\int e^x \, dx$
 - D: $\int 1/x \, dx$
-

Q4: What is the integral of $x \cos(x)$ with respect to x ?

- A: $x \sin(x) - \cos(x) + C$
 - B: $x \sin(x) + \cos(x) + C$
 - C: $x \sin(x) - 2 \cos(x) + C$
 - D: $x \sin(x) + 2 \cos(x) + C$
-

Q5: What is the integral of $\ln(x)$ with respect to x ?

- A: $x \ln(x) - x + C$
 - B: $x \ln(x) + x + C$
 - C: $x \ln(x) - 1/x + C$
 - D: $x \ln(x) + 1/x + C$
-

Q6: What is the integral of $x^3 e^x$ with respect to x ?

- A: $x^3 e^x - 3x^2 e^x + 6x e^x - 6e^x + C$
 - B: $x^3 e^x - 3x^2 e^x + 6x e^x + 6e^x + C$
 - C: $x^3 e^x + 3x^2 e^x - 6x e^x + 6e^x + C$
 - D: $x^3 e^x + 3x^2 e^x - 6x e^x - 6e^x + C$
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Q7: What is the integral of $\tan(x)$ with respect to x ?

- A: $\ln(\cos(x)) + C$
 - B: $\ln(\sec(x)) + C$
 - C: $\ln(\sin(x)) + C$
 - D: $\ln(\csc(x)) + C$
-

Q8: What is the integral of $\ln(x^2 + 1)$ with respect to x ?

- A: $x \ln(x^2 + 1) - 2 \tan^{-1}(x) + C$
 - B: $x \ln(x^2 + 1) + 2 \tan^{-1}(x) + C$
 - C: $x \ln(x^2 + 1) - \tan^{-1}(x) + C$
 - D: $x \ln(x^2 + 1) + \tan^{-1}(x) + C$
-

Q9: What is the integral of $x^2 \sin(x)$ concerning x ?

- A: $-x^2 \cos(x) + 2x \sin(x) + 2 \cos(x) + C$
 - B: $-x^2 \cos(x) - 2x \sin(x) - 2 \cos(x) + C$
 - C: $-x^2 \cos(x) + 2x \sin(x) - 2 \cos(x) + C$
 - D: $-x^2 \cos(x) - 2x \sin(x) + 2 \cos(x) + C$
-

Q10: What is the integral of $x^4 \ln(x)$ with respect to x ?

- A: $x^4 \ln(x) - 4x^3 \ln(x) + 12x^2 \ln(x) - 24x \ln(x) + 24x + C$
 - B: $x^4 \ln(x) - 4x^3 \ln(x) + 12x^2 \ln(x) - 24x \ln(x) - 24x + C$
 - C: $x^4 \ln(x) - 4x^3 \ln(x) + 12x^2 \ln(x) + 24x \ln(x) - 24x + C$
 - D: $x^4 \ln(x) - 4x^3 \ln(x) + 12x^2 \ln(x) + 24x \ln(x) + 24x + C$
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Answers

Q1: $A - e^x(x + C)$

Q2: $D - u$

Q3: $C - \int e^x dx$

Q4: $A - x \sin(x) - \cos(x) + C$

Q5: $A - x \ln(x) - x + C$

Q6: $A - x^3 e^x - 3x^2 e^x + 6x e^x - 6e^x + C$

Q7: $B - \ln(\sec(x)) + C$

Q8: $B - x \ln(x^2 + 1) + 2 \tan^{-1}(x) + C$

Q9: $C - x^2 \cos(x) + 2x \sin(x) - 2 \cos(x) + C$

Q10: $B - x^4 \ln(x) - 4x^3 \ln(x) + 12x^2 \ln(x) - 24x \ln(x) - 24x + C$