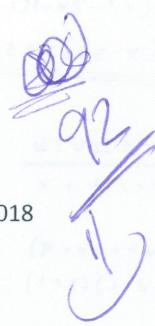


Prepa Tec Campus Cumbres
Calculus II 3 partial Quiz # 1A



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Choose T (true) or F (false) for each statement.

1. The partial fraction decomposition of the integral $\int \frac{4x^2+5x-45}{x^3-2x^2-15x} dx$ is $\frac{A}{x} + \frac{B}{(x+3)} + \frac{C}{(x-5)}$

F V

2. The integral of $\int \frac{5x^2+20x+6}{x^3+2x^2+x} dx$ is $6 \ln|x| - \ln|x+1| - 9 \ln|x+1| + C$

F V

3. The integral of $\int (18 - 12x)(x^2 - 3x)^2 dx$ is $-2(x^2 - 3x)^4 + C$

F V

4. The integral of $\int 5x \sqrt{x-3} dx$ is $(x-3)^{\frac{5}{2}} + (x-3)^{\frac{3}{2}} + C$

F V

5. Solve the following integral, THE STEPS OF YOUR PROCEDURE.

$$\int \frac{x^3 - 3x^2 + 1}{x^2 - 1} dx$$

$$\int \frac{x^3 - 3x^2 + 1}{(x+1)(x-1)} dx = \frac{3/2}{(x+1)} - \frac{1/2}{(x-1)} = \frac{3}{2} \ln|x+1| - \frac{1}{2} \ln|x-1| + C$$

$$\begin{aligned} & \frac{A}{(x+1)} + \frac{B}{(x-1)} \\ A(x-1) + B(x+1) &= x^3 - 3x^2 + 1 \\ x=1 & \quad x=-1 \end{aligned}$$

$$x = \frac{1}{2} - \frac{3}{2} = -\frac{2}{3}$$

$$\frac{x^2 - 3x + \frac{3}{2} \ln|x+1| - \frac{1}{2} \ln|x-1| + C}{2}$$

$$A + B(-1) = (-1)^3 - 3(-1)^2 + 1$$

$$B(-1) = 1 - 3 + 1$$

$$B(-1) = -1$$

$$B = -1/2$$

$$A(-1 - 1) + 0 = (-1)^3 - 3(-1)^2 + 1$$

$$A(-2) = -1 - 3 + 1$$

$$A(-2) = -3$$

$$A = 3/2$$

CORRECTION:

$$\begin{aligned} & \frac{x-3}{x^2-1} \\ & \frac{-x^3+3x^2+0x+1}{-x^3+0+x} \\ & \frac{-3x^2+x+1}{-x^2+0-3} \\ & \frac{x-2}{x-2} \end{aligned}$$

$$(x-3) + \frac{x-2}{x^2-1}$$

$$\frac{A}{(x+1)} + \frac{B}{(x-1)}$$

$$A(x-1) + B(x+1)$$

$$K=1 \quad K=-1$$

$$\int \frac{x^3 - 3x^2 + 1}{x^2 - 1} dx = (x-3) + \frac{x-2}{(x+1)(x-1)} = (x-3) + \frac{3/2}{(x+1)} - \frac{1/2}{(x-1)}$$

$$A + B(-1) = 1 - 2$$

$$B(-1) = -1$$

$$B = -1/2$$

$$A(-1 - 1) = -1 - 2$$

$$A(-2) = -3$$

$$A = 3/2$$

$$= \frac{x^2}{2} - 3x + \frac{3}{2} \ln|x+1| - \frac{1}{2} \ln|x-1| + C$$

$$\textcircled{1} \quad x^3 - 2x^2 - 15x$$

$$\times (x^2 - 2x - 15)$$

$$\times (x-5)(x+3)$$



$$\textcircled{2} \quad \frac{5x^2 + 20x + 6}{x^3 + 2x^2 + x} = \frac{5x^2 + 20x + 6}{x(x+1)(x+1)}$$

$$\times (x^2 + 2x + 1)$$

$$\times (x+1)(x+1)$$

$$\frac{A}{x} + \frac{B}{(x+1)} + \frac{C}{(x+1)}$$

$$A(x+1) + B(x)(x+1) + C(x)(x+1)$$

$$x = -1 \quad x = 0$$

$$Ax^2 + A2x + A2 + BX^2 + BX + CX^2 + CY$$

$$x^2(A+B+C) + x(2A+B+C) + 2A$$

$$\text{Intermediate value of } (x^2)(A+B+C) \text{ to form } A+B+C$$

$$A+B+C = 5$$

$$2A+B+C = 20$$

$$2A = 15$$

$$\textcircled{3} \quad \int (18 - 12x)(x^2 - 3x)^2 dx \quad \left| \frac{-6(x^2 - 3x)^3}{3} = -2 \underline{(x^2 - 3x)^3} + C \right.$$

$$u = x^2 - 3x$$

$$du = 2x - 3$$

$$\textcircled{4} \quad \int 5x\sqrt{x-3} dx = \int 5(u+3)u^{1/2} du = \int (5u + 15)u^{1/2} du = \int 5u^{3/2} + 15u^{1/2} du = \int \frac{5u^{5/2}}{5/2} + \frac{15u^{3/2}}{3/2} = 2u^{5/2} + 10u^{3/2}$$
$$u = x-3 \quad x = u+3 \quad \frac{5}{1} - \frac{5}{2} = \frac{10}{5} = 2 \quad \frac{15}{1} - \frac{3}{2} = \frac{30}{3} = 10$$
$$du = 1 \quad dx = du \quad = 2(x-3)^{5/2} + 10(x-3)^{3/2} + C$$