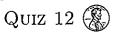
Name: Richard



MATH 201March 4, 2025

1.
$$\int \frac{81}{x^3 - 9x^2} dx = \int \frac{81}{\chi^2(\chi - q)} dx = \int \frac{-1}{\chi} - \frac{q}{\chi^2} + \frac{1}{\chi - q} dx$$

$$= -\ln|\chi| + \frac{9}{\chi} + \ln|\chi - 9| + C$$

$$\frac{81}{\chi^{2}(\chi-9)} = \frac{A}{\chi} + \frac{B}{\chi^{2}} + \frac{C}{\chi-9} + \frac{1}{\chi^{2}} + \frac{1}{\chi^{2}} + \frac{C}{\chi-9} + \frac{1}{\chi^{2}} + \frac{1}{\chi^{2}} + \frac{C}{\chi-9} + \frac{1}{\chi^{2}} +$$

$$81 = Ax(x-9) + B(x-9) + Cx^{2}(x)$$

$$81 = A9(9-9) + B(9-9) + C.9^{2}$$

$$C = I$$

$$81 = A0(0-9) + B(0-9) + C.0^{2}$$

$$B = -9$$

Now Equation (*) is 81 = Ax(x-9)-9(x-9)+22

$$81 = A \cdot 10(10-9) - 9(10-9) + 10^{2}$$

$$81 = 10A - 9 + 100$$

$$-10 = 10A$$

$$A = +1$$

$$=\frac{-9}{\chi^2}+\frac{1\cdot\chi-(\chi-9)\cdot 1}{\chi^2}$$

$$=\frac{-9}{x^2}+\frac{\chi}{\chi-9}\frac{(\chi-\chi+9)}{\chi^2}$$

$$= -\frac{9}{x^2} + \frac{9x}{(x-9)x^2} = \frac{1}{2}$$

$$= -\frac{9}{x^2(x-9)} + \frac{9x}{x^2(x-9)}$$

$$= \frac{7(\chi-q)}{\chi^2(\chi-q)} + \frac{1}{\chi^2(\chi-q)}$$

$$= \frac{7(\chi-q)}{\chi^2(\chi-q)} + \frac{1}{\chi^2(\chi-q)}$$

$$\int_{-\infty}^{\infty} \frac{-9x + 81 + 9x}{x^{2}(x-9)} = \frac{81}{x^{3}-9x^{2}}$$

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Quiz 12 🗐

MATH 201 March 4, 2025

1.
$$\int \frac{x}{(x+3)^2} dx = \int \frac{1}{\chi+3} - \frac{3}{(\chi+3)^2} d\chi = \left| \ln |\chi+3| + \frac{3}{\chi+3} + C \right|$$

$$\frac{\chi}{(\chi+3)^2} = \frac{A}{\chi+3} + \frac{B}{(\chi+3)^2}$$

$$\chi = A(\chi + 3) + B$$

$$\chi = A\chi + 3A + B$$

$$\Psi$$

$$1 \cdot \chi + 0 = A\chi + (3A + B)$$

$$A = 1$$

$$3A + B = 0$$

 $3 \cdot (+ B = 0)$

$$\sqrt{B=-3}$$

Check:
$$\frac{d}{dx} \left[\ln |x+3| + \frac{3}{x+3} + C \right]$$

$$= \frac{1}{\chi + 3} - \frac{3}{(\chi + 3)^2} + 0$$

$$=\frac{\chi+3}{(\chi+3)^2}-\frac{3}{(\chi+3)^2}$$

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

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