

Name: October 11

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Calculate: $\int_2^3 \frac{x+2}{x^3-x} dx$.

- (A) $\frac{5}{2} \ln 2 - \frac{9}{2} \ln 3$ (B) $\frac{7}{2} \ln 3 - \frac{5}{2} \ln 2$ (C) $\frac{9}{2} \ln 2 - \frac{5}{2} \ln 3$ (D) $\frac{3}{2} \ln 3 - \frac{7}{2} \ln 2$

$$\int_2^3 \frac{x+2}{x(x-1)(x+1)} dx = \int_2^3 \frac{-2}{x} + \frac{3/2}{x-1} + \frac{1/2}{x+1} dx$$

$$= -2 \ln x + \frac{3}{2} \ln(x-1) + \frac{1}{2} \ln(x+1) \Big|_2^3$$

$$= -2 \ln 3 + 2 \ln 2 + \frac{3}{2} \ln 2 + \frac{1}{2} \ln 4 - \frac{1}{2} \ln 3$$

$$= -\frac{5}{2} \ln 3 + \frac{7}{2} \ln 2 + \ln 2$$

$$= \frac{9}{2} \ln 2 - \frac{5}{2} \ln 3 \quad (C)$$