

A

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

$$= \int \left[\frac{2/3}{x-1} + \frac{4/3}{x+2} \right] dx$$

7 pt

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

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

$$\frac{2x}{(x-1)(x+2)} = \frac{A}{x-1} + \frac{B}{x+2}$$

1 pt

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

$$\boxed{x = -2} \quad -4 = B(-3) \Rightarrow B = \frac{4}{3}$$

$$\boxed{x = 1} \quad 2 = 3A \Rightarrow A = \frac{2}{3}$$

2 pt

B

$$\int \frac{3x}{x^2 + 5x + 4} dx$$

$$= \int \left[\frac{-1}{x+1} + \frac{4}{x+4} \right] dx$$

$$= -\ln|x+1| + 4\ln|x+4| + C$$

$$\frac{3x}{x^2 + 5x + 4} = \frac{3x}{(x+1)(x+4)}$$

$$\frac{3x}{(x+1)(x+4)} = \frac{A}{x+1} + \frac{B}{x+4}$$

$$3x = A(x+4) + B(x+1)$$

$$\boxed{x = -1} \quad -3 = 3A \Rightarrow A = -1$$

$$\boxed{x = -4} \quad -12 = -3B \Rightarrow B = 4$$