

Name: *Soutians*

Section: 7 8

1. Write the abstract partial fraction decomposition of

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

$$\frac{A}{x} + \frac{B}{x^2} + \frac{C}{x^3} + \frac{D}{2x-1} + \frac{Ex+F}{x^2+5} + \frac{Gx+H}{(x^2+5)^2}$$

2. Evaluate the integral by performing partial fraction decomposition

$$\int \frac{x+2}{(x-1)(x+3)} dx.$$

$$\frac{x+2}{(x-1)(x+3)} = \frac{A}{x-1} + \frac{B}{x+3}$$

clear fractions

$$\Rightarrow x+2 = A(x+3) + B(x-1)$$

clear #'s: -3, 1

$$x = -3: -3+2 = A(-3+3) + B(-3-1)$$

$$-1 = B(-4)$$

$$B = 1/4$$

$$x = 1: 1+2 = A(1+3) + B(1-1)$$

$$3 = A(4)$$

$$A = 3/4$$

$$= \int \frac{3/4}{x-1} + \frac{1/4}{x+3} dx$$

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