

Directions: Show all work on a separate sheet of paper for full credit.

1. Write out the form of the partial fraction decomposition of the given function. DO NOT FIND THE VALUE OF THE COEFFICIENTS.

(a) $\frac{4 + x}{(1 + 2x)(3 - x)}$

(b) $\frac{1 - x}{x^3 + x^4}$

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

(d) $\frac{1}{x^2 + x^4}$

(e) $\frac{x^4}{(x^2 - x - 1)(x^2 + 2)^2}$

2. Evaluate the integral

(a) $\int \frac{5x + 1}{(2x + 1)(x - 1)} dx$

(b) $\int \frac{y}{(y + 4)(2y - 1)} dy$

(c) $\int_0^1 \frac{2}{2x^2 + 3x + 1} dx$

(d) $\int \frac{4y^2 - 7y - 12}{y(y + 2)(y - 3)} dy$

(e) $\int_0^1 \frac{x^2 + x + 1}{(x + 1)^2(x + 2)} dx$

(f) $\int \frac{x^2 - x + 6}{x^3 + 3x} dx$