

WORKSHEET 10: INTEGRATION BY PARTIAL FRACTIONS

Due at the beginning of class on the day of Test 2

Direction: Solve the problems in this worksheet on separate sheets of paper. Write your solution neatly. Use standard size paper. Clearly label each problem, and include each problem in the correct order. No ragged edges. Staple multiple pages. At the top of the first page put your name, Math 2414, and the title of the worksheet. Show all work to justify your answer. Answer with insufficient work will receive no credit.

Problem 1: Determine the correct form of the partial fraction decomposition

Write the form of the partial fraction decomposition of the given expression. Do not solve for the constants.

1. $\frac{2x-3}{x^3+10x}$

3. $\frac{1}{(x^2-9)^2}$

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

4. $\frac{x^5+1}{(x^2-x)(x^4+2x^2+1)}$

Problem 2: Linear factors - Distinct and repeated

Find the integrals

1. $\int \frac{x^2+12x+12}{x^3-4x} dx$

3. $\int \frac{5x-2}{(x-2)^2} dx$

2. $\int_0^2 \frac{3}{4x^2+5x+1} dx$

Problem 3: Quadratic factors - Distinct and repeated

Find the integrals

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

3. $\int \frac{dx}{x(x^2+4)^2}$

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

Problem 4: u -sub and partial fractions

Find the integrals

1. $\int \frac{5\cos(x)}{\sin^2(x)+3\sin(x)-4} dx$

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