

Group: _____

Name: _____

ma138 Worksheet 5, September 7th, 2017

Partial Fractions

1. Write down the partial fractions decompositions for the following rational functions. Do not solve for the constants.

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

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

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

Hint: It may help you to re-write x^5 as $(x+0)^5$

2. Find the partial fractions decomposition of the rational function $\frac{3x^2-1}{(x)(x-1)(x+1)}$

3. Use your answer from the previous problem to evaluate $\int \frac{3x^2 - 1}{(x)(x - 1)(x + 1)} dx$. Your first step should be to replace the integrand with its partial fractions decomposition.

4. Integrate the following function by first using the method of partial fractions to rewrite the integrand as a sum of simpler rational functions.

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