

Calculus II: Integration Project

Due date: Wed, 5 Dec 12

Problem: Let $q(x) = \alpha x^2 + \beta x + \gamma$ be an irreducible quadratic polynomial (one that doesn't factor), and consider the rational function

$$f(x) = \frac{ax^2 + bx + c}{[q(x)]^2}.$$

- a) Find the partial fraction decomposition of $f(x)$.
- b) Use your answer from part a) to help calculate the integral

$$\int \frac{2x^2 + 6x + 6}{(x^2 + 2x + 2)^2} dx.$$

Show all of your work for each part.