MATH 1552 - Calculus II - Section 3
Spring 2013

QUIZ 3

Tuesday, February 5th

Name:

Read the questions carefully. The number of points available for each problem are given in parentheses. Remember to show your work - correct answers without justification will not receive full credit.

1) (13 points) Evaluate \( \int \frac{2x^2 - 7x - 13}{(x+5)(x-1)^2} \, dx \)

\[
\frac{2x^2 - 7x - 13}{(x+5)(x-1)^2} = \frac{A}{x+5} + \frac{B}{x+1} + \frac{C}{(x-1)^2}
\]

\(2x^2-7x-13 = A(x-1)+B(x-1)(x+5)+C(x+5)\)

\(x = -5: \quad 50+35-13 = 36A \quad \Rightarrow \quad A = \boxed{\frac{1}{2}}\)

\(x = 1: \quad 2-7-13 = 6C \quad \Rightarrow \quad C = \boxed{-3}\)

\(x = 0: \quad -13 = A-5B+5C \quad \Rightarrow \quad B = \boxed{0}\)

\[
\int \frac{2x^2 - 7x - 13}{(x+5)(x-1)^2} \, dx = \int \left( \frac{2}{x+5} - \frac{3}{(x-1)^2} \right) \, dx \quad \text{with} \quad u = x-1
\]

\[= 2 \ln |x+5| - 3 \int \frac{1}{u^2} \, du = 2 \ln |x+5| - 3u^{-1} + C \quad = 2 \ln |x+5| + \frac{3}{u} + C \quad = 2 \ln |x+5| + \frac{3}{x-1} + C
\]