PRINT Your Name:____________________

Quiz 7 — October 10, 2012 – Section 10 – 11:15 – 12:05

Remove everything from your desk except a pencil or pen.

$\boxed{\text{Circle}}$ your answer. **Show your work.** Your work should be correct and coherent.

The quiz is worth 5 points.

Find $\displaystyle\int \frac{1}{x^2-3x+2}\,dx$**. Check your answer.**

The denominator factors as $(x-2)(x-1)$. We find numbers A and B with

$$\frac{1}{x^2-3x+2} = \frac{A}{x-2} + \frac{B}{x-1}.$$

Multiply both sides by $(x-1)(x-2)$ to get

$$1 = A(x-1) + B(x-2).$$

Plug in $x = 1$ to see that $B = -1$. Plug in $x = 2$ to see that $1 = A$. We check that

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

So, the original problem is equal to

$$\int \frac{1}{x-2} + \frac{-1}{x-1}dx = \boxed{\ln|x-2| - \ln|x-1| + C}.$$

Check: The derivative of the proposed answer is $\frac{1}{x-2} + \frac{-1}{x-1}$ and we already saw that this last expression is equal to $\dfrac{1}{x^2-3x+2}$.