

PRINT Your Name: _____

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

Remove everything from your desk except a pencil or pen.

Circle your answer. **Show your work.** Your work should be correct and coherent.

The quiz is worth 5 points.

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