Quiz 8

Key

Show *all* your work. Reasonable supporting work must be shown for any partial credit.

1. [3] Write out the form of the partial fraction decomposition of the function (as done in WebHW7-4#1-3). You do *not* earn any extra marks for finding the numerical values of the coefficients.

$$\frac{x-20}{x^2+x-56} = \frac{x-20}{(x+8)(x-7)}$$

Start (+.5)

So $\frac{A}{x+8}$ (+.5) $+ \frac{B}{x-7}$ (+.5)

form (+.5)

Factored correctly (+.5) (+.5)

2. For each of the following, identify the technique you would use to find the indefinite integral. For example, if you think substitution would work, write "substitution" and identify what u would be.

   (a) [2] (Activity: Rational Functions)

start (+.5)

ag method (+.5)

$$\int \frac{2x}{3x^2-1}\,dx$$

(+.5) Substitution (+.5) $u = 3x^2-1$

$du = 6x\,dx$

$\Rightarrow \frac{1}{3}\,du = 2x\,dx$

$\int \frac{1}{3}\,\frac{1}{u}\,du$

   (b) [2] (Activity: Rational Functions)

start (+.5)

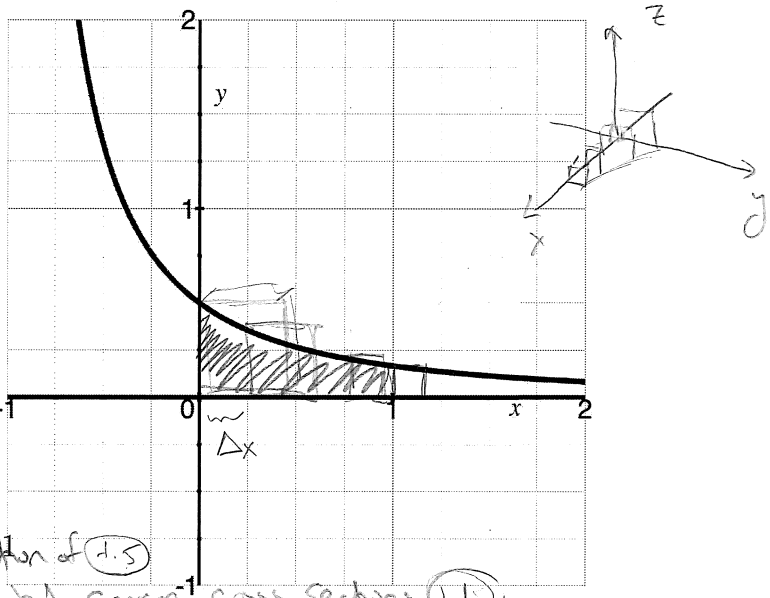
ag method (+.5)

$$\int \frac{2}{x^2+1}\,dx = 2\int \frac{1}{x^2+1}\,dx$$

use $\arctan(x) = y$ (+.5)

$= 2\arctan(x) + C$ (+.5) have const/simplify

3. [3] (WrittenHW7-4#70) Consider the volume of the solid whose base is bounded by $y = 0$, $x = 0$, $x = 1$ and $f(x) = \dfrac{1}{x^2+3x+2}$. The cross sections perpendicular to the x-axis form squares. Set up the definite integral that would find the volume.
Note that f is graphed on the right.
Do *not* compute this!!!



Sum area of square Δx

$\int_0^1 (y\text{-coord})^2\,dx$

$\int_0^1 \left(\frac{1}{x^2+3x+2}\right)^2 dx$

integral (+.5)

bounds (+1)

dx / orientation of (+.5)

not circles but square cross sections (+.5)