Mathematics 126 **Fourth 6.1 Area**

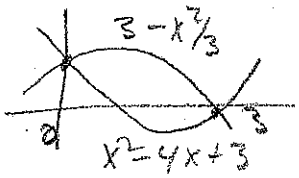
1. Set up an integral expression without absolute values for the exact area enclosed by the parabolas $y = x^2 - 4x + 3$ and $y = 3 - x^2/3$. Approximate with fnInt.

$x^2 - 4x + 3 = 3 - \frac{x^2}{3}$

$\frac{4x^2}{3} - 4x = 0$

$x^2 - 3x = 0$

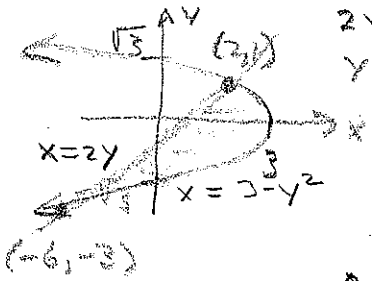
$x = 0, 3$



$A = \int_0^3 \left(3 - \frac{x^2}{3} - (x^2 - 4x + 3)\right) dx$

$= 6$

2. Set up an integral expression without absolute values for the exact area of the region enclosed by the curves $x + y^2 = 3$ and $2y = x$. Approximate with fnInt.



$2y + y^2 = 3$

$y^2 + 2y - 3 = 0$

$(y+3)(y-1) = 0$

$y = 1, -3$

$x = 2, -6$

$A = \int_{y=-3}^{1} (3 - y^2 - 2y)\,dy \cong 10.667$

3. Set up an integral expression without absolute values for the exact area of the region enclosed by the curves ~~$x = 0.5$~~, $x = \frac{1}{\sqrt{1-y^2}}$. Approximate with fnInt.

$x = 1.5$

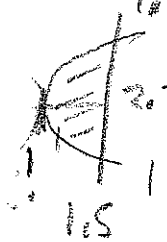
$1.5 = \frac{1}{\sqrt{1-y^2}}$

$2.25 = \frac{1}{1-y^2}$

$1 - y^2 = \frac{1}{2.25}$

$y^2 = 1 - \frac{1}{2.25} = 1 - \frac{4}{9} = \frac{5}{9}$

$y = \pm \frac{\sqrt{5}}{3}$



$A = \int_{-\sqrt{5}/3}^{\sqrt{5}/3} \left(1.5 - \frac{1}{\sqrt{1-y^2}}\right) dy \cong 0.554$

 Understand the methods so you can solve similar problems.
Understand the concepts so you can solve unfamiliar problems.
Study the (a) class notes, (b) text examples, (c) do the text exercises, and (d) do the 4th hour problems.