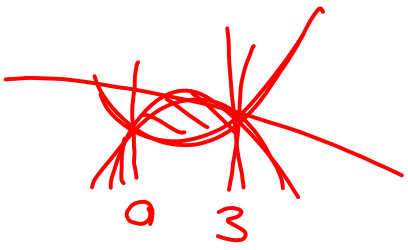
Volume

$y=x^2+1$, $y=-x^2+2x+5$, $x=0$, $x=3$

about x-axis



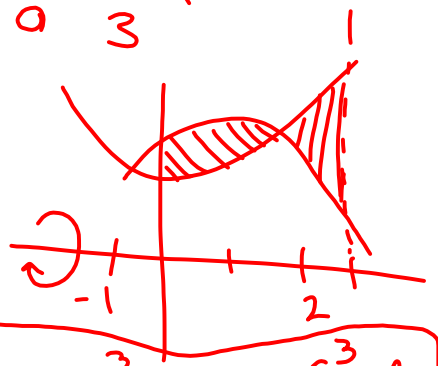
$x^2+1=-x^2+2x+5$

$2x^2-2x-4=0$

$2(x^2-x-2)=0$

$2(x-2)(x+1)=0$

$x=-1, 2$



$$\int_0^2 \pi\left(-x^2+2x+5\right)^2 dx - \int_0^2 \pi\left(x^2+1\right)^2 dx + \int_2^3 \pi\left(x^2+1\right)^2 dx - \int_2^3 \pi\left(-x^2+2x+5\right)^2 dx$$

6.4 #6 Arc Length $= \int_a^b \sqrt{1+[f'(x)]^2}\,dx$

$y=\frac{3}{2}x^{2/3}+4$, $[1,27]$

$f(x)=\frac{3}{2}x^{2/3}+4$

$f'(x)=x^{-1/3}$

$$\int_1^{27} \sqrt{1+\left(\frac{1}{\sqrt[3]{x}}\right)^2}\,dx$$

1

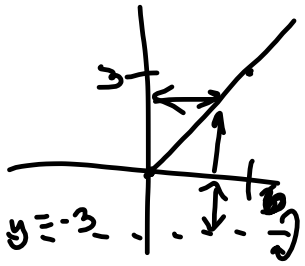
Surface of Revolution

$2\pi r h$, h = arc length

6.4

36. $y = \frac{x}{2}$, $[0,6]$ about x-axis

$$\int_0^6 2\pi\left(\frac{x}{2}\right)\cdot\sqrt{1+\left(\frac{1}{2}\right)^2}\,dx$$



@ $y = -3$

$$\int_0^6 2\pi\left(3+\frac{x}{2}\right)\cdot\sqrt{1+\left(\frac{1}{2}\right)^2}\,dx$$

$y = \frac{x^2}{2}$, $[0,2]$ @ x-axis

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

FRIDAY: applied part of Test (volume, arc length, area)

Know Your Formulas!

Monday: Integration Part

Homework:

- 6.1 #1-9 odd; 19, 43 (area between curves)
- 6.2 #11, 13, 17, 19, 21, 25, 29, 35 (volume of solid of revolution)
- 6.4 #5, 7, 13, 33, 35 (arc length and surface of revolution)

- 7.1 #5-53 odd (basic integration rules)
- 7.2 #1-35odd (integration by parts)

- 7.3 #3-15odd; 21-37odd; 47-67odd (trigonometric integrals)
- 7.4 #5-15odd; 19-43odd (trigonometric substitution)

- **OLD TEST #3 problems**