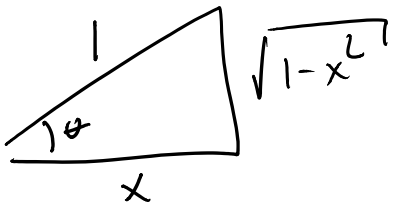
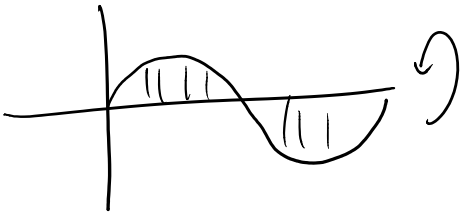
Lecture22: exam2 review, contd.

Wednesday, October 15, 2014 12:55 PM

Don't write $\sin(\arccos x)$

$\rightsquigarrow \sin(\underbrace{\arccos x}_{\theta}) = \sin\theta = \frac{\sqrt{1-x^2}}{1} = \sqrt{1-x^2}$





$y = \sin x$

$$V = \int_0^{2\pi} \pi r^2 dx = \int_0^{2\pi} \pi |y|^2 dx$$

$$= \int_0^{2\pi} \pi |\sin x|^2 dx$$

$$= \int_0^{2\pi} \pi \sin^2 x \, dx$$

$$= \pi \int_0^{2\pi} \frac{1-\cos 2x}{2} dx = \pi \int_0^{2\pi} \frac{1}{2} dx - \pi \frac{1}{2} \int_0^{2\pi} \cos 2x \, dx$$

$$\left(\quad \right)\Big|_0^{2\pi}$$

$$\frac{\pi}{2}(2\pi) - \frac{\pi}{2}\left[\frac{1}{2}\sin 2x\right]_0^{2\pi}$$

$$\pi^2 - \frac{\pi}{4}\left[\sin 4\pi - \sin 0\right] = \pi^2 - 0$$
$$= \pi^2$$

$$\cos^2 x = \frac{1+\cos 2x}{2}$$

$$\int x^{12} e^x dx = x^{12} e^x - 12\int x^{11} e^x dx$$

$u = x^{12}$ $\quad du = 12x^{11}$

$dv = e^x dx$ $\quad v = e^x$

$$x^{12}e^x - 12\left[x^{11}e^x - 11\left[x^{10}e^x - 10\cdot\left[x^9 e^x - 9\left[x^8 e^x - 8\left[x^7 e^x - 7\left[x^6\right.\right.\right.\right.\right.\right.$$

See lecture 13