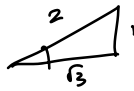


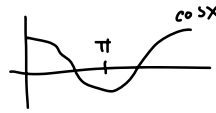
Math 1172 HW #4
Section 6.6 #1, 19, 71, 75

#1

$$\sin^{-1}(1/2) = \pi/6 \quad (30^\circ)$$



$$\cos^{-1}(-1) = \pi \quad (180^\circ)$$

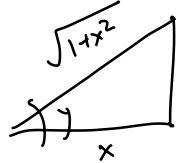


#19

$$y = \cot^{-1} x$$

$$x = \cot y$$

$$1 = -\csc^2 y \cdot \frac{dy}{dx}$$



$$\csc y = \frac{\text{hypo}}{\text{opp}} = \sqrt{1+x^2}$$

$$\frac{dy}{dx} = -\left(\frac{1}{\sqrt{1+x^2}}\right)^2 = \boxed{\frac{-1}{1+x^2}}$$

#71

$$\int \frac{t^2}{\sqrt{1-t^6}} dt$$

$$u = t^3$$

$$du = 3t^2 dt$$

$$= \frac{1}{3} \int \frac{1}{\sqrt{1-u^2}} du = \frac{1}{3} \sin^{-1} u + C = \underline{\underline{\frac{1}{3} \sin^{-1}(t^3) + C}}$$

#75

$$\int \frac{1}{\sqrt{a^2 - x^2}} dx = \int \frac{1}{\sqrt{a^2} \sqrt{1 - \frac{x^2}{a^2}}} dx = \frac{1}{a} \int \frac{1}{\sqrt{1 - (x/a)^2}} dx$$

$$u = x/a$$

$$du = \frac{1}{a} dx$$

$$a du = dx$$

$$= \frac{1}{\cancel{a}} \int \frac{1}{\sqrt{1-u^2}} \cdot \cancel{a} du = \sin^{-1} u + C$$

$$= \sin^{-1}\left(\frac{x}{a}\right) + C$$