Section 8.4 Notes

December 7, 2019

Conference Example

$$\int \frac{\sqrt{9-x^2}}{x^2}\,dx$$

$$x = 3\sin(\theta) \quad -\pi/2 \le \theta \le \pi/2 \quad dx = 3\cos(\theta)d\theta$$

$$\int \frac{\sqrt{9-9\sin^2(\theta)}}{9\sin^2(\theta)} 3\cos(\theta)\,d\theta$$

$$= \int \frac{9\sqrt{1-\sin^2(\theta)}\cos(\theta)}{9\sin^2(\theta} \,d\theta$$

$$= \int \frac{\cos^2(\theta}{\sin^2(\theta)}\,d\theta$$

$$= \int \cot^2(\theta)\,d\theta$$

$$= \int (\csc^2(\theta) - 1)\,d\theta$$

$$= -\cot(\theta) - \theta + C$$

$$= -\frac{\sqrt{9-x^2}}{x} - \arcsin(\frac{x}{3}) + C$$