Quiz 2 Solutions

Fall 2018

MATH 222

Name: _____

Problem 1. (5 Points) Compute

$$\int \sec^4(\theta)\tan^4(\theta)\, d\theta$$

Solution 1.

If we let $u = \tan(\theta)$ then $du = \sec^2(\theta)d\theta$. And the integral becomes,

$$\int (u^2+1)u^4\, du = u^7/7 + u^5/5 + C = \tan(\theta)^7/7 + \tan(\theta)^5/5 + C.$$

□

Problem 2. (5 Points) Compute $\int \frac{1}{\sqrt{4-x^2}}\, dx$. You may use your answer to problem 1.

Solution 2.

If we let $x = 2\sin(\theta)$ then $dx = 2\cos(\theta)$,

$$\int \frac{2\cos(\theta)}{2\cos(\theta)}\, d\theta = \theta + C = \arcsin(x/2) + C.$$

□