Quiz 3 Solutions **Fall 2018**

MATH 222-001

Name: _____

Problem 1. (5 Points) Evaluate $\displaystyle\int_0^2 \frac{1}{(4+x^2)^{3/2}}\,dx$.

Solution 1.

If we let $x = 2\tan(\theta)$ then $dx = 2\sec^2(\theta)$ and this integral becomes

$$\int_0^{\pi/4} \frac{2\sec^2(\theta)}{(4+4\tan^2(\theta))^{3/2}}\,d\theta$$

If we simplify we have

$$\frac{1}{4}\int_0^{\pi/4} \frac{1}{\sec(\theta)}\,d\theta = \frac{1}{4}\int_0^{\pi/4} \cos(\theta)\,d\theta = \frac{1}{4}\left(\frac{\sqrt{2}}{2}\right)$$

$\square$

Problem 2. (5 Points) Find A, B and C so that $\displaystyle\frac{x^2}{(x^2-4)(x-1)} = \frac{A}{x-2} + \frac{B}{x+2} + \frac{C}{x-1}$.

Solution 2.

$A = 1$, $B = 1/3$ and $C = -1/3$. $\square$