American River College
MATH 402: Calculus III
Quiz 3: 12.1 - 12.3

Name: Key
Student ID: _____
Signature: _____

- Show all work
- No notes, books, or calculators allowed.

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1. (3 points) Find the equation of the plane that passes through the point $P(1, 3, -5)$ and has a normal vector of $\mathbf{n} = \langle -6, 2, -3 \rangle$

$$-6(x-1) + 2(y-3) + (-3)(z+5) = 0$$

2. (4 points) Find the domain of the function. You do NOT have to graph the domain.

$$f(x, y) = \frac{x + y}{y \sin(x)}$$

$y \sin(x) \neq 0$

$y \neq 0$

$x \neq n\pi$ where n is an integer

$$\{(x,y) \mid y \neq 0 \text{ and } x \neq n\pi, n \in \mathbb{Z}\}$$

3. (3 points) Evaluate the limit.

$$\lim_{(x,y)\to(-2,1)} \frac{(3x^2 - y)\cos(\pi x)}{\sqrt{2x + 5y^2}}$$

$$= \frac{(3(-2)^2 - 1)\cos(-2\pi)}{\sqrt{2(-2) + 5(1)^2}}$$

$$= \frac{(12 - 1)(1)}{\sqrt{-4 + 5}} = \boxed{11}$$