Quiz 2- MAC 2311, F'14 NAME: Answer & Grading Key Panther ID: _____

1. (6 pts) Compute the derivative of each of the following functions:

(a) $f(x) = 5x^4 - 2\sqrt{x} + \pi^2 = 5x^4 - 2x^{\frac{1}{2}} + \pi^2$ (3 pts)

$f'(x) = 5 \cdot 4x^3 - 2 \cdot \frac{1}{2} x^{-\frac{1}{2}} + 0$ (1 pt) (1 pt) (1 pt)

$\boxed{f'(x) = 20x^3 - \frac{1}{\sqrt{x}}}$

(b) $g(x) = \sec x \tan x$ (3 pts) 1.5 pts (for prod. rule)

$g'(x) = (\sec x)' \tan x + (\sec x) \cdot (\tan x)'$

$g'(x) = \sec x \cdot \tan x \cdot \tan x + \sec x \cdot \sec^2 x$

$g'(x) = \sec x \cdot \tan^2 x + \sec^3 x$ (1.5 pts)

2. (5 pts) Find the equation of the tangent line to the graph of $f(x) = \frac{x}{x^2-2}$ at $x = 2$.

$f(2) = \frac{2}{2^2-2} = \frac{2}{2} = 1$ So Point: $(2, 1)$ (1 pt)

$f'(x) = \left(\frac{x}{x^2-2}\right)' \underset{\text{Rule}}{=} \frac{1 \cdot (x^2-2) - x \cdot 2x}{(x^2-2)^2} = \frac{x^2-2-2x^2}{(x^2-2)^2} = \frac{-x^2-2}{(x^2-2)^2}$ (1 pt) (1 pt)

$m_{\text{tan}} = f'(2) = \frac{-2^2-2}{(2^2-2)^2} = \frac{-6}{4} = -\frac{3}{2}$ (1 pt)

Thus, the tangent line is

$\boxed{y - 1 = -\frac{3}{2}(x-2)}$ (1 pt)