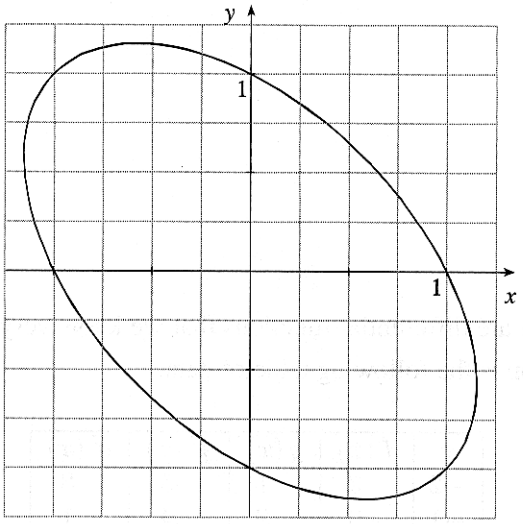
Math 124 Group Worksheet *(Sec. 2.9)* **Name**_____

Directions: Work in groups of 2-3. You may need extra paper.

1. Consider the equation $x^2 + xy + y^2 = 1$, graphed below.



(a) Find an expression for $\frac{dy}{dx}$ in terms of x and y.

(b) Find all points where the tangent line is horizontal.

(c) Find all points where the tangent line is parallel to the line $y = -x$.

2.

Compute derivatives of the following functions.

(a) $f(x) = e^{2\pi x}$

(b) $g(x) = x^{2\pi e}$

(c) $h(x) = (e\pi)^{2x}$

(d) $l(x) = \pi^{(e^{2x})}$

(e) $F(x) = \left(\sqrt{x}\right)^{3x^2}$

3 I told you in class that $\frac{d}{dx}\sec^{-1}(x) = \frac{1}{x\sqrt{x^2-1}}$. Give a deviation of this formula by using implicit differentiation and trigonometric identities. (Don't skimp…you are expected to know this and be able to show it clearly for exams.)