Name: _____

QUIZ 5
September 25, 2001

Calculators are not allowed!

1. Find $f'(x)$ if

$$f(x) = \ln\left(\frac{x^2}{\sqrt{1-x}}\right).$$

Hint: Use the properties of logs before taking the derivative.

2. Use the technique of implicit differentiation to find $\frac{dy}{dx}$ if

$$x^2 + 4x + y^2 - 3y + 1 = 0.$$

Solutions to Quiz #5

1. Use the properties of logs to write

$$\ln\left(\frac{x^2}{\sqrt{1-x}}\right) = 2\ln x - (1/2)\ln(1-x).$$

Now differentiate to get

$$\frac{2}{x} + \frac{1}{2(1-x)}.$$

2. Take $\frac{d}{dx}$ of both sides:

$$\frac{d}{dx}\left(x^2 + 4x + y^2 - 3y + 1\right) = 0$$

$$2x + 4 + 2y\frac{dy}{dx} - 3\frac{dy}{dx} = 0.$$

Now solve for $\frac{dy}{dx}$ to get

$$\frac{dy}{dx} = \frac{2x+4}{3-2y}.$$