

MATH 170 – Section 006 – Quiz 7

You may work with other class members on this quiz, but you may *not* receive assistance from people not in your MATH 170 section. You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or **YOU WILL GET A 'ZERO' ON THE QUIZ**. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by the beginning of class on Friday, 23 October 2009. GOOD LUCK!

1) Consider the ellipse

$$x^2 + \frac{y^2}{4} = 1.$$

a) Find an equation of each line that is both tangent to the ellipse and has a slope of 2.

b) Find $\frac{d^2y}{dx^2}$ in terms of y only.

2) Consider the equation

$$\ln(x + y) = e^{3y}.$$

Find $\frac{dy}{dx}$.

3) Prove:

$$\frac{d}{dx}(\operatorname{arccot} x) = \frac{-1}{1 + x^2}.$$

What is the domain of $\operatorname{arccot} x$? Explain. What is the range of $\operatorname{arccot} x$? Explain. Sketch the graph of $y = \operatorname{arccot} x$.