

Math 124B  
Quiz # 5  
February 15, 2001

Name: \_\_\_\_\_

Student Number: \_\_\_\_\_

Section      BA      BB      BC      BD

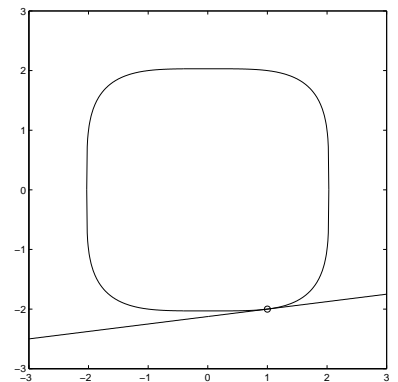
**Box your answers so it's clear where they are! Show your work!**

1. (8 points) Compute the derivative  $f'(x)$  of the function  $f(x) = \sin(\sqrt{x} + 3x^4)$

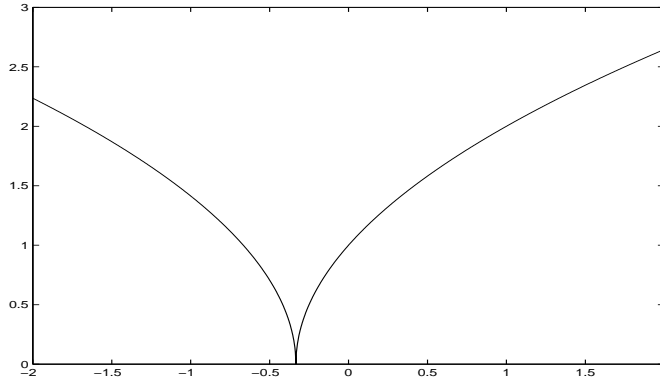
2. (7 points) The point  $(1, -2)$  lies on the curve defined by the equation  $x^4 + y^4 = 17$ , shown in the figure below.

(a) (5 points) **Use implicit differentiation** to determine the slope  $\frac{dy}{dx}$  at this point.

(b) What is the equation of the line shown in the figure?



3. Let  $f(x) = \sqrt{|1 + 3x|}$  for all real  $x$ . A portion of this function is sketched below.



- (a) (5 points) Determine  $f'(x)$  and give its domain.

- (b) (3 points) Determine  $f''(x)$  and give its domain.

- (c) (2 points) For what values of  $x$  is  $f''(x) > 0$ ?