

# Math 133

Quiz 3 Sample

September 23, 2008

You may use your calculator and as specified in class. Indicate any calculations you do with the calculator and show your algebra whenever calculations are done by hand.

1. A population of bacteria consists of 100 cells at time  $t = 0$ . There are 1000 cells after 24 hours.

(a) Find the doubling time for the population.

(b) Write an exponential formula for  $P(t)$ , the population at time  $t$ .

(c) Use your formula to find the time when there are 1500 cells in the population.

2. Let  $y = f(x)$  be defined by  $y = 3 + 2^{(5x+1)}$ .

(a) Find a formula for the inverse function of  $f(x)$ .

(b) What is the domain of the inverse function?

3. The following figure contains the graph of the function  $f(x) = \sin(x) + \sin(2x - \frac{\pi}{4})$ .

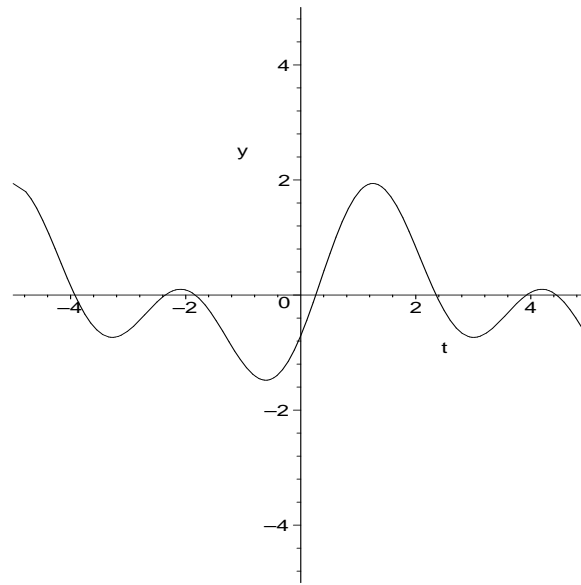


Figure 1:

- Mark the largest interval on the graph of  $f(x)$  containing the  $y$ -intercept  $(0, -\frac{\sqrt{2}}{2})$  so that  $f(x)$  has an inverse function on this interval.
- Sketch the inverse function for  $f(x)$  for this interval on the above figure.
- What is the range of the inverse function on this interval?