

Quiz 2 (20 points in total)  
Section 201/202 (circle one)  
Name:

1. [6 points] The average weight of a squirrel in Ann Arbor oscillates sinusoidally between a low of 5 pounds on January 1 and a high of 9 pounds on July 1, and a low of 5 pounds on January 1 next year again. Suppose that the function  $P(t)$  gives the average weight in pounds of an Ann Arbor squirrel  $t$  months after January 1.

a). What is the amplitude of  $P(t)$ ?

b). What is the period of  $P(t)$ ?

c). Find a formula for  $P(t)$ .

2. [2 points]  $f(x) = \sin(x)^x$ , write down the limit definition of  $f'(3)$ . (You don't need to calculate it, just write the definition.)

3. [4 points] The cost,  $C$  (in dollars) to produce  $g$  gallons of ice cream can be expressed as  $C = f(g)$ . Assume  $f$  is invertible. Interpret

(1)  $f'(100) = 2.5$

(2)  $(f^{-1})'(100) = 2.5$

4. [6 points] Consider a particle, whose position,  $s$ , is given by the table

$t$ (seconds)	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6
$S$ (feet)	0.5	1.4	3.8	6.5	9.6	9.2	8.7	6.1

(1) Estimate the velocity of the particle at  $t = 0.2$ . (Don't forget the unit)

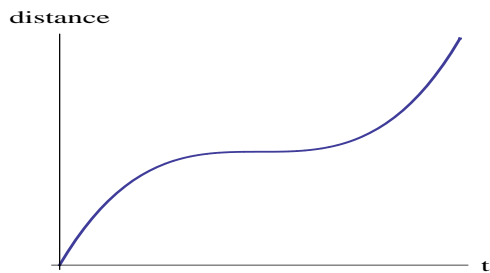
(2) Use (1) and the table to estimate the position of the particle at  $t = 0.17$ . (Don't forget the unit)

(3) For which  $t$ , does the velocity appear to be positive?

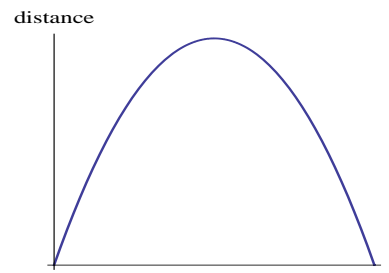
5.[2 points] See figure 1, which graph represents the position of an object that is speeding up and then slowing down?

**Answer:**

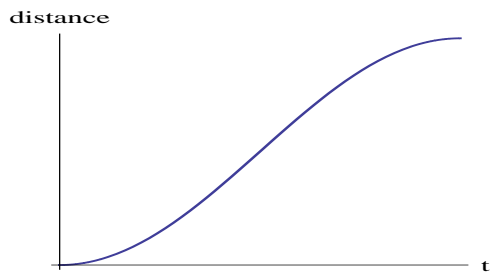
Figure 1: Problem 5



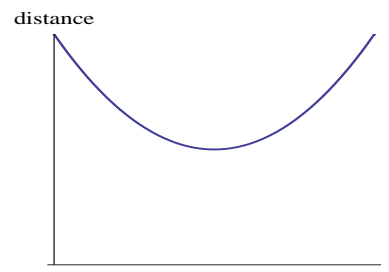
(a)



(b)



(c)



(d)