

3. Use the information below to find an equation that best models the situation and most accurately fits the given data.

(a) i. (2 points) Suppose a pair of shoes at DSW costs \$50 after a 10% discount. Find a formula for $P(n)$, the price of the shoes after n discounts of 10%, where $n \geq 0$.

ii. (4 points) Find and interpret $P'(4)$ in the context of this problem.

(b) (6 points) Michigan's population (in millions) for the last three years as measured by the U.S. Census Bureau is given below.

Year	2005	2006	2007
Population	10.108	10.102	10.071

Find a formula to approximate the population of Michigan, $P(t)$, with t in years since 2005. Using this information, approximate the population of Michigan in 2008. Show your work.

(c) (6 points) The height $h(t)$ (in ft. above the ground) of a passenger on a ferris wheel (a circular fair ride) varies from a maximum of 50 ft. to a minimum of 2 ft. as a function of time t (in minutes). If the ferris wheel makes 0.1 revolutions/minute, and the passenger is initially at the top of the ride, find a formula for the vertical velocity of the passenger, $v(t)$.