

6. [12 points] *Remember to show your work carefully. All numbers appearing in your answers should either be in exact form or be accurate to at least 3 decimal places.*

Authorities in Volterra, Italy noticed an increase in the sales of extra-strength dental floss at supermarkets in the city during the early part of the year 2010. Let $D = p(t)$ denote the quantity of extra-strength dental floss, in meters, sold in Volterra on day t of 2010 (where $t = 1$ represents January 1). We are told that $p(t)$ is an exponential function.

- a. [5 points] 400 meters of extra-strength dental floss were sold in Volterra on January 7, and 600 meters of extra-strength dental floss were sold on January 23. Find a formula for $p(t)$ in terms of t .

$p(t) =$ _____

- b. [3 points] How long does it take for the quantity of extra-strength dental floss sold each day to double?

Answer: _____

- c. [4 points] Sales of flea shampoo have also been increasing. If $F = q(t)$ is the quantity of flea shampoo, in grams, sold in Volterra on day t of 2010, then $q(t) = \ln(t + 1) + 65$. Find a formula for $q^{-1}(F)$ in terms of F .

$q^{-1}(F) =$ _____