

POLYNOMIAL EQUATION WORD PROBLEM

The number of hospitals located in the US from 1960 to the present can be approximated by the following:

$$N = 0.09996x^3 - 7.17x^2 + 113.7x + 6771.2$$

where N is the number of hospitals and x represents the year when $x = 0$ corresponds to 1960.

- a) Graph the following equation displaying the number of hospitals in the US from 1960 to 2015.
- b) Create a table displaying the number of hospitals in the US starting in 1960 and increasing in intervals of 5 years through 2010.
- c) Calculate the relative minimum of the graph and interpret its meaning. Be sure to include the year and the number of hospitals.
- d) In the year 2000 there were 9873 hospitals in the US. By how much does the model differ from the actual value?

The price of a share of a certain stock can be modeled by the following formula where y is the price of the stock in dollars and x is the year where $x = 0$ corresponds to January of 2007.

$$Y = x^4 - 10x^3 + 33x^2 - 40x + 16$$

a) Graph the value of the stock from July of 2006 through July of 2013.

$X_{\min} =$ _____

$X_{\max} =$ _____

$Y_{\min} =$ _____

$Y_{\max} =$ _____

b) Find the value of the stock in July of 2007. _____

c) Find the value of the stock in January of 2009. _____

d) Find the value of the stock in July of 2013. _____

e) There's a saying with stocks that you should buy low and sell high. From January 2007 to July of 2013:

1. Identify the 2 times (to the nearest $\frac{1}{2}$ a year) when you should have bought this stock.
2. Identify the time (to the nearest $\frac{1}{2}$ year) when you should have sold this stock.