Sinusoidal, or trigonometric, regression is much more complicated than either linear or exponential. It should be used in situations that appear periodic in nature.

The soil's temperature beneath the ground varies in a periodic manner. A temperature probe was left 3 feet underground and recorded the temperature as a function of the number of days since January 1^{st} (x = 0). The temperatures for 14 days throughout the year are shown below.

4,	X Day	5	36	57	94	127	153	192
	Temp (°F)	41	37	36	40	48	64	68
	Day	226	241	262	289	305	337	356
	Temp (°F)	66	61	58	49	44	42	40

(a) Find a best fit sinusoidal function for this data set in the form $y = a \sin(bx + c) + d$. Round all parameters to the nearest hundredth.

(b) Based on the model from (a) what are the highest and lowest temperatures reached in the soil? Highest = 52.03+15.21=67.24Lowest = 52.03-15.21=36.82

(c) What is the average soil temperature?

(midline or vert.shift)

Source for questions: www.emathinstruction.com

If it says SOLVE ALGEBRAICALLY - No other method will be accepted for full credit. Check on calculator with intersect when possible.

Solve the following system of equations algebraically:

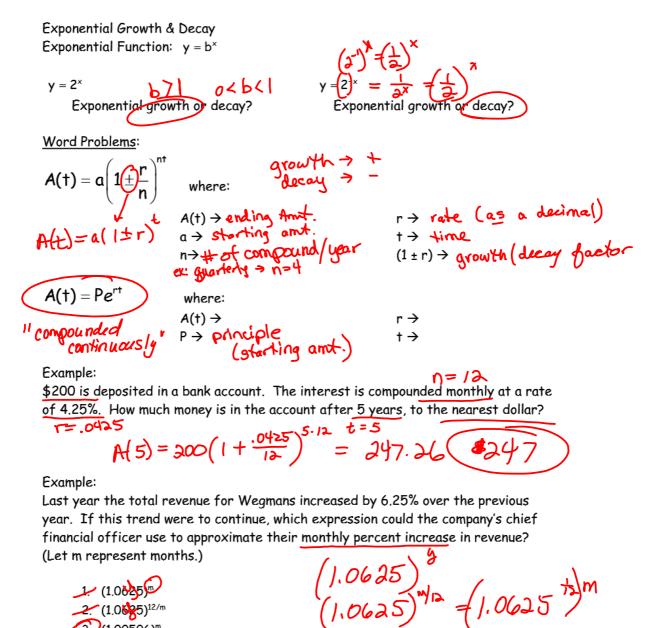
$$5 = y - x$$

 $4x^2 = -17x + y + 4$

Determine algebraically the x-coordinate of all points where the graphs of xy = 10 and y = x + 3 intersect.

$$y = \frac{10}{X}$$

Regents Review #3 - Exponents and Logarithms



Solving exponential equations using logs or natural logs (In)