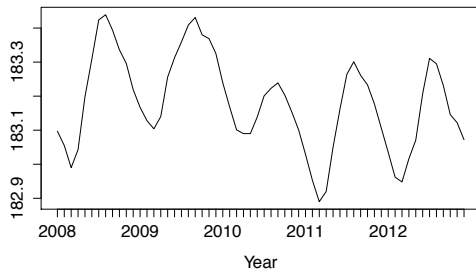


Match made... on earth

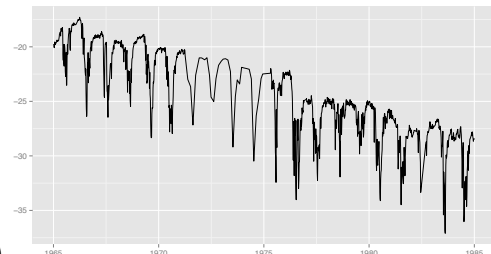
1. Match the following graphs and stories.

- (a) The lynx population in the Yukon Territory fluctuates with a period of about 9.6 years.
- (b) Well depth, a proxy for aquifer level, shows a seasonal variation with constant winter levels and sharp decreases each summer.
- (c) The arctic lemming population peaks about every four years. (This is true in Canada, Norway, and all arctic lemming populations.)
- (d) The water level of Lake Superior fluctuates seasonally, and the average yearly level has been declining for several years.

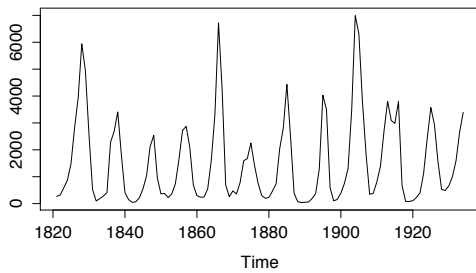
(The water level graphs use monthly measurements, while the population graphs use yearly averages.)



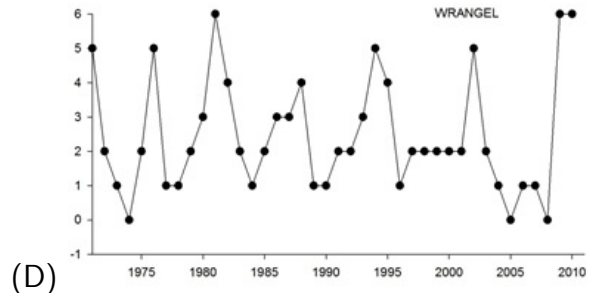
(A)



(B)



(C)

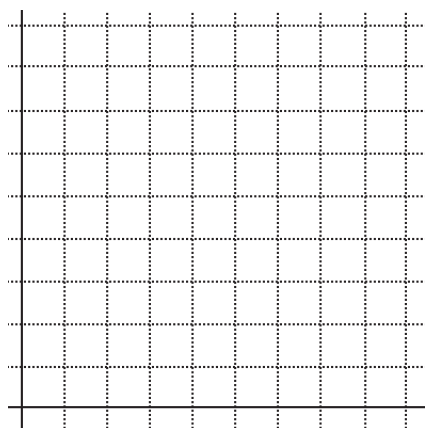
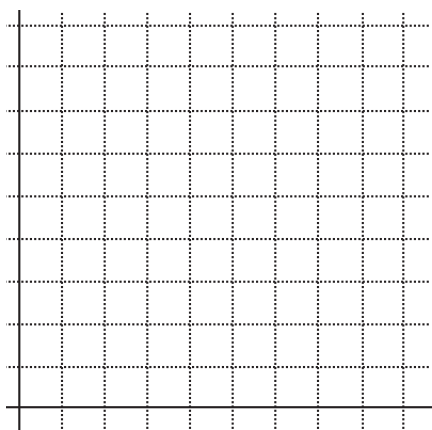


(D)

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2. Translate each phrase into the language of derivatives and then sketch a possible graph, labeling axes appropriately:

- (a) The growth rate of the population $P(t)$ increased steadily over the period of observation.
- (c) While average yearly population is increasing, the population $P(t)$ continues to show a 6-year population cycle.



- (b) Road salt usage $S(t)$ was zero during summer months, began rising in November, and peaked in March.

- (d) The substance in the soil $S(t)$ has a decay rate proportional to its quantity. The initial amount is 4 grams per cubic meter of soil.

