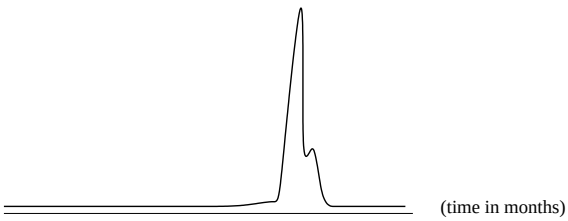
6. (2 points each) Google Trends is an online website which tracks how frequently certain search strings are entered into Google. Entering the term "pumpkin" produces a graph similar to the graph below.



Google Trend for "pumpkin"

Not surprisingly, this graph is basically periodic over a 12-month period. Suppose we call this function $P(t)$, where the horizontal axis represents time, t in months since December (so $t = 1$ is January of any given year). The values of $P(t)$ represent how often a term is searched for, relative to the total number of searches. The spike in the pumpkin graph, again not surprisingly, comes around $t = 10$ each year. (We figure the second, smaller spike represents queries about what to do with rotting pumpkins....) Other trends are seasonal as well–*e.g.*, "summer camps." On the other hand, some searches have a quick peak and die forever (or at least for longer than a year)–*e.g.*, "Vice Presidential debates."

Assume that the peak in the graph above occurs at the point (10, 100). Use this information to determine the coordinates of the peak for the following searches that have similar patterns but peak at different points. On each line below, give the coordinates of the peak in the new function, given that function's relationship to the function P.

(a) The peak for the function C if $C(t) = 10P(t)$. (10, 1,000)

(b) The peak for the function K if $K(t) = P(t+2)$. (8, 100)

(c) The peak for the function G if $G(t) = P(t)+2$. (10, 102)

(d) The peak for the function H if $H(t) = 3P(t-5)+1$. (15, 301)

(e) In the context of this problem, does $P(-10)$ make sense? If so, what would that mean? If not, explain why not.

Yes, $P(-10)$ represents the same scenario in the previous February (recall that $P(-t)$ represents the graph of $P(t)$ reflected about the vertical axis).