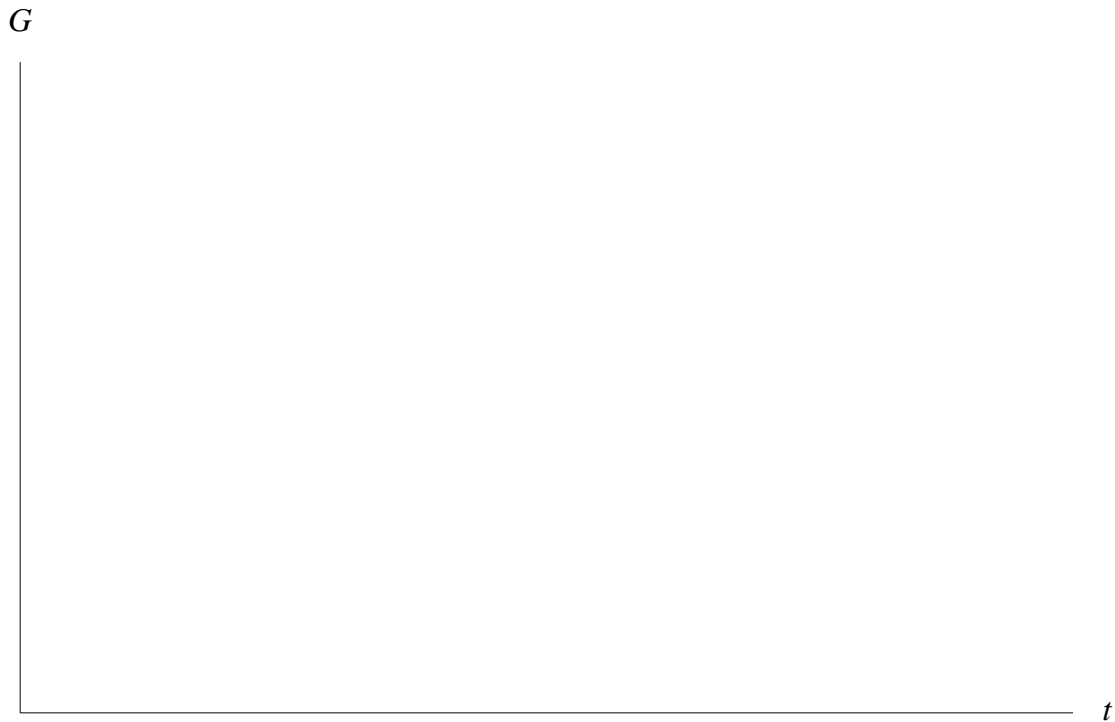


4. [10 points] Before the industrial era, the carbon dioxide ( $\text{CO}_2$ ) level in the air in Ann Arbor was relatively stable with small seasonal fluctuations caused by plants absorbing  $\text{CO}_2$  and producing oxygen in its place. Typically, on March 1, the  $\text{CO}_2$  concentration reached a high of 270 parts per million (ppm), and on September 1, the concentration was at a low of 262 ppm. Let  $G(t)$  be the  $\text{CO}_2$  level  $t$  months after January 1.
- a. [5 points] Assuming that  $G(t)$  is periodic and sinusoidal, sketch a neat, *well-labeled* graph of  $G$  with  $t = 0$  corresponding to January 1.



- b. [5 points] Determine an explicit expression for  $G$ , corresponding to your sinusoidal graph above.