2. Suppose \( A(t) \) is a function that gives the average high temperature (in \(^\circ\)F) in Ann Arbor as a function of \( t \) measured in months where \( t = 0 \) represents January (the coldest month in Ann Arbor).

(a) (2 points) Puerto Montt, a city in Chile, is approximately the same distance from the equator as Ann Arbor, but it is in the southern hemisphere where the warmest month is January. Let \( P(t) \) be a function that gives the average high temperature in \(^\circ\)F in Puerto Montt as a function of time, \( t \), in months. Write \( P(t) \) in terms of \( A(t) \).

\[
P(t) = A(t - 6) \text{ or, (equally acceptable) } P(t) = A(t + 6)
\]

(b) (2 points) The average high temperatures in Montreal are approximately 10\(^\circ\)F less than the average highs in Ann Arbor. If \( M(t) \) is a function that gives the average high temperature in Montreal as a function of time, \( t \) in months, express \( M(t) \) in terms of \( A(t) \).

\[
M(t) = A(t) - 10
\]

(c) (5 points) The average high temperature in Ann Arbor ranges from a low of 30\(^\circ\)F in January to a high of 84\(^\circ\)F in July. Use this information to write \( A(t) \) as trigonometric function.

\[
A(t) = -27 \cos\left(\frac{\pi}{6} t\right) + 57
\]

(d) (1 point) What is the amplitude of the function found in (c)? \[
\text{27}
\]

(2 points) What is the period of the function found in (c)? \[
\text{12 months}
\]