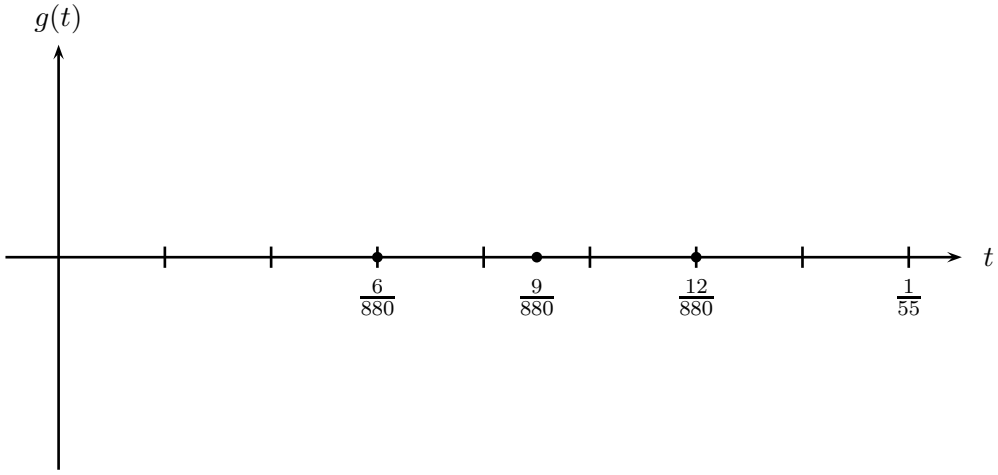
2. If you pluck a guitar string, a point P on the string vibrates. The motion of the point P is given by

$$g(t) = A\cos(220\pi\, t),$$

where $g(t)$ is the displacement (in mm) of P from its position before the string was plucked, t is the number of seconds after the string was plucked, and A is a positive constant.

(a) (6 points) Sketch a graph of $g(t)$, for $0 \le t \le 1/55$, on the axes below. Be sure to indicate A on your sketch.



(b) (3 points) Sketch tangent lines to your graph at $t = 6/880$, $t = 9/880$, and $t = 12/880$. Use these to write the numbers $g'(6/880)$, $g'(9/880)$, and $g'(12/880)$ in order from least to greatest.

$$g'(\_\_\_\_\_) \quad < \quad g'(\_\_\_\_\_) \quad < \quad g'(\_\_\_\_\_)$$

(c) (3 points) What is the meaning of A, in terms of the plucked string?