6. [11 points] For this problem, your final answers must be exact and should be written in the spaces provided.

a. [5 points] Let $V(t)$ be the voltage across a resistor in a circuit (measured in volts) $t$ minutes after 8:00 a.m. on January 29, 2013. The function $V(t)$ is periodic, and it takes 5 minutes to go from a minimum of $-10$ volts to a maximum of 40 volts. At 8:37 a.m., the voltage across the resistor is $-10$ volts. Find a formula for $V(t)$, assuming $V(t)$ is a sinusoidal function of $t$.

\[
V(t) = \quad \text{(Formula)}
\]

b. [6 points] Find all values of $t$ in the interval $-0.5 \leq t \leq 1$ for which:

\[
5 \sin \left(2\pi \left(t + \frac{1}{4}\right)\right) + 3 = 0
\]

Your answer must be found algebraically and should be exact. You must show your work carefully to receive full credit.

The solutions in $-0.5 \leq t \leq 1$ are \quad \text{(List of solutions)}