8. [9 points] A space ship has landed on Planet X. Scientists discovered that the surface temperature of Planet X oscillates sinusoidally between a maximum of 170°C to a minimum of −40°C. It takes 7 hours for the surface temperature to decrease from its maximum to its minimum. At the time the space ship landed, the surface temperature was −40°C. Let $P = g(t)$ be the surface temperature (in °C) of Planet X, t hours after the space ship landed.

a. [4 points] Find a formula for $g(t)$.

$g(t)$=_____

The surface temperature K (in °C) of a moon of Planet X, t hours after the spaceship landed on Planet X, is given by the formula

$$K = Q(t) = 20 - 70\cos\left(\frac{2\pi}{3}t\right).$$

b. [5 points] Find the times in the interval $-1 \leq t \leq 3$ when the surface temperature of the moon is equal to 10°C. Find your answer algebraically. Your solutions should be in **exact form**.

Answer=_____