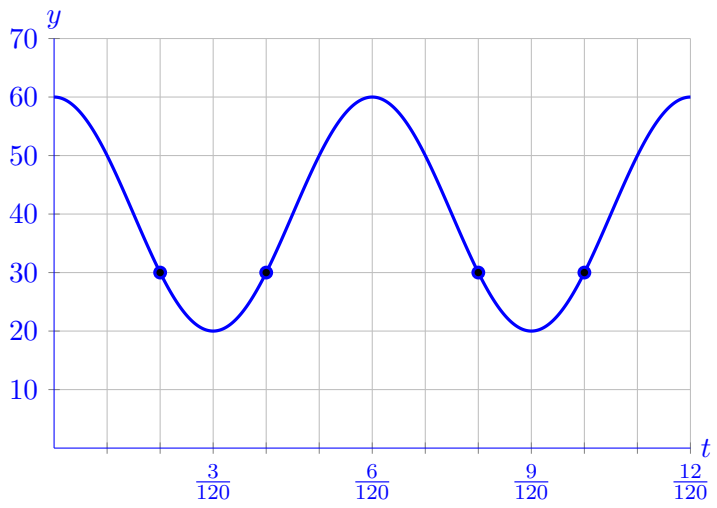
5. [6 points] The sound of a jet engine during aircraft take-off, measured at a distance of about 50 meters from the engine, is given by its sinusoidal sound pressure function $P(t)$, in Pascals (Pa), where t is the time in seconds after the plane enters the runway. The sound pressure reaches its maximum of 60 Pa at $t = 0$ seconds, and the smallest positive time where it reaches its minimum of 20 Pa is $t = 1/40$ seconds.

a. [3 points] Find a formula for $P(t)$.

Answer: $P(t) =$ $40 + 20\cos\left(40\pi t\right)$

b. [3 points] Given that the sound pressure function is 50 Pa at $t = 1/120$ seconds, find all t-values where $P(t)$ is equal to 30 Pa within the first 0.1 seconds.
(Note that $0.1 = \frac{2}{20} = \frac{4}{40}$*.)*



Answer: $t =$ $\frac{2}{120}, \frac{4}{120}, \frac{8}{120}, \frac{10}{120}$

6. [5 points] Let

$$K(p) = 2^{\cos p} + \sqrt{(3p)}.$$

Use the limit definition of the derivative to write an explicit expression for $K'(5)$. *Your answer should not involve the letter* K*. Do not attempt to evaluate or simplify the limit.* Write your final answer in the answer box provided below.

Answer: $K'(5) =$ $\lim_{h\to 0} \dfrac{2^{\cos(5+h)} + \sqrt{3(5+h)} - \left(2^{\cos 5} + \sqrt{15}\right)}{h}$