

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:**  $P(t) =$  \_\_\_\_\_

- 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:**  $t =$  \_\_\_\_\_

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:**  $K'(5) =$