

9. [10 points] After a long, cold winter, a ship's captain sails across Lake Michigan to Chicago. Upon arrival, the captain hosts a party on board to celebrate the arrival of spring. The party begins at exactly 6 pm and ends at exactly midnight. Let  $N(t)$  be the noise level, in decibels, of the ship captain's party  $t$  hours after it begins. During the party, a formula for  $N(t)$  is given by

$$N(t) = 0.5t^4 - 4t^3 + 7t^2 + 60.$$

- a. [8 points] Find the exact values of  $t$  that minimize and maximize  $N(t)$  on the interval  $[0, 6]$ . Use calculus to find your answers, and be sure to show enough evidence that the points you find are indeed global extrema.

(For each answer blank below, write NONE in the answer blank if appropriate.)

**Answer:** Global min(s) at exactly  $t =$  \_\_\_\_\_

**Answer:** Global max(es) at exactly  $t =$  \_\_\_\_\_

- b. [2 points] How loud does the captain's party get? *Remember to include units.*

**Answer:** \_\_\_\_\_