Work for problem 2(a)

\[ \int_{9}^{17} e(t) \, dt = \int_{9}^{17} \frac{15000}{(t^2 - 24t + 160)} \, dt = 6004.27 \]

\[ \approx 6004 \text{ people} \]

Work for problem 2(b)

\[ \int_{9}^{25} \left( \frac{15000}{t^2 - 24t + 160} \right) \, dt = \text{TOTAL ENTERED} \]

\[ = 7275.55 \approx 7276 \text{ people} \]

\[ \frac{7276}{6004} \]

After 5 \[\times \$11 = \$13,992\]

Before 5 \[\times \$15 = \$90,060\]

\[ \text{on the given day} \]

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Work for problem 2(c)

\[ H(17) = \int_9^{17} \left( \frac{15600}{t^2 - 246 + 160} \right) - \left( \frac{9890}{t^2 - 386 + 370} \right) \, dt = 3725 \]

\[ H'(17) = \left( \frac{15600}{17^2 - 24(17) + 160} \right) - \left( \frac{9890}{17^2 - 38(17) + 370} \right) = 380 - 760 \]

\[ H'(17) = -380 \quad \rightarrow \text{This is the rate of change at 5 o'clock that people are entering the park compared to those leaving the park.} \]

\[ H(17) = 3725 \quad \rightarrow \text{This is the amount of people instantaneously at the park.} \]

Work for problem 2(d)

\[ H'(t) = \frac{15600}{(t^2 - 246 + 160)} - \frac{9890}{t^2 - 386 + 370} = 0 \]

\[ t = 15.7948 \]
Work for problem 2(a)

\[ \int_{q}^{17} \frac{15600}{(t^2 - 24t + 160)} \, dt = 6004 \text{ people} \]

Work for problem 2(b)

\[ 15 \int_{q}^{17} \frac{15600}{(t^2 - 24t + 160)} \, dt + 11 \int_{17}^{23} \frac{1890}{(t^2 - 32t + 270)} \, dt \]

\[ 90064 + 54950 \]

\[ 115014 \]
Work for problem 2(c)

\[ H'(4) = E(4) - L(4) \]
\[ H'(17) = 20.4178 - 760.7692 \]
\[ H'(17) = -452.2814 \]

\[ H(17) \] represents the number of people in the park at \( t=17 \). \( H'(17) \) represents the rate at which the population of the park is changing at \( t=17 \).

Work for problem 2(d)

\[ 3(4) - L(4) = 0 \]
\[ \frac{15600}{t^2 + 28t + 160} - \frac{9690}{t^2 + 38t + 370} = 0; \quad t = 15.79481 \]