

Calculator Practice 2

- The number of people entering a concert can be modeled by the function $f(t) = 560e^{\sin t}$, where t represents the number of hours after the gates are open.
 - Find the values of $f\left(\frac{1}{2}\right)$ and $f'\left(\frac{1}{2}\right)$. Using correct units, explain what each value represents in the context of this problem.
 - How many people have entered the concert 2 hours after the gates are opened? Is the number of people entering increasing or decreasing at this time? Justify your answer.
- After being poured into a cup, coffee cools so that its temperature, $T(t)$, is represented by the function $T(t) = 70 + 110e^{-\frac{t}{2}}$, where t is measured in minutes and $T(t)$ is measured in degrees Fahrenheit.
 - What is the temperature of the coffee 5 minutes after it has been poured into the cup?
 - Is the temperature decreasing faster 1 minute after it is poured or 3 minutes after it is poured? Give a reason for your answer.

3. If $f(x) = -0.4 \sin(4x - 2) + 2.5 \ln(0.3x^2 + 4)$, find the following

a. $f(3)$

b. Find the equation of the tangent line to the graph of $f(x)$ through $x = 4$.

c. $f'(7)$

d. Find the smallest positive value of x at which the tangent line to $f(x)$ is horizontal.

e. Find the smallest positive value of x at which the tangent line to the graph of f has a slope of $1\frac{1}{2}$.

f. $f''(0.75)$