5. [8 points] Remember to show your work carefully throughout this problem.

Algie and Cal go on a picnic, arriving at 12:00 noon.

a. [5 points] Five minutes after they arrive, they notice that 5 ants have joined their picnic. More ants soon appear, and after careful study, they determine that the number of ants appears to be increasing by 20% every minute. Find a formula for a function \( A(t) \) modeling the number of ants present at the picnic \( t \) minutes past noon for \( t \geq 5 \).

\[ A(t) = \ldots \]

Answer: \( A(t) = \ldots \)

b. [3 points] Algie and Cal notice that their food is, unfortunately, also attracting flies. The number of flies at their picnic \( t \) minutes after noon can be modeled by the function \( g(t) = 1.8(1.25)^t \). Algie and Cal decide they will end their picnic when there are at least 1000 flies. How long will their picnic last? Include units.

\[ \text{Answer: } \ldots \]

6. [6 points] Consider the function

\[ R(w) = 2 + (\ln(w)) \cos(w). \]

Use the limit definition of the derivative to write an explicit expression for \( R'(\pi) \).

Your answer should not involve the letter \( R \). Do not attempt to evaluate or simplify the limit.

Please write your final answer in the answer box provided below.

\[ \text{Answer: } R'(\pi) = \ldots \]