5. [10 points] Electric cars need large amounts of energy to operate. Most types of batteries, including those found in electric cars, have reduced capacities when discharged at higher rates. For the lithium-ion batteries used in the newest electric cars, this relationship can be expressed by the equation $C = f(I) = \frac{K}{I^n}$ where C is the working capacity of the battery in amp hours (Ah) given a discharge rate of I (with $n > 1$) measured in amps (A). The constant $K > 0$ is the rated capacity of the battery.

a. [5 points] Write a formula for the derivative of C at $I = 3$ using the limit definition of the derivative. You do not need to evaluate or simplify this expression.

b. [3 points] Is C increasing or decreasing at $I = 3$? Justify your answer.

c. [2 points] What is the concavity of the graph of C at $I = 3$? Justify your answer.