1. Fill in the missing information for the following two theorems.

(a) **Mean Value Theorem (for derivatives)**

If \( f \) is \( \text{____________________________} \) on the closed interval \([a,b]\),

and \( f \) is \( \text{____________________________} \) on the open interval \((a,b)\),

then there is a number \( c \) in \((a,b)\) such that \( \text{____________________________} \)

(b) **Mean Value Theorem for Integrals**

If \( f \) is \( \text{____________________________} \) on \([a,b]\),

then there is a number \( c \) in \([a,b]\) such that \( \text{____________________________} \).

(c) **Prove** the Mean Value Theorem for Integrals by applying the Mean Value Theorem (for derivatives) to the function

\[
F(x) = \int_{a}^{x} f(t) \, dt
\]

(d) **Team Discussion (not optional):**

What does the term “mean value” refer to in each theorem?

In your proof in part (c), how do you know \( F(x) \) satisfies the two hypotheses of the Mean Value Theorem (for derivatives)?