

1. Suppose that f has a positive derivative for all values $x \in \mathbb{R}$ and that $f(1) = 0$. Consider

$$g(x) = \int_0^x f(t) dt.$$

Determine whether the following statements about the function g are True or False and give reasons for your answers.

- (a) g is integrable over $[0, 1]$.

- (b) g has a local maximum at $x = 1$.

- (c) The graph of dg/dx crosses the x -axis at $x = 1$.