

1. [12 points]

For the following statements, select True if the statement is *ALWAYS* true, and select False otherwise. No explanations are required.

a. [2 points]

If f is a differentiable function and $\frac{f(5.1) - f(5)}{0.1} = -3$,
then $f'(5) = -3$.

True

False

b. [2 points]

If g is a continuous function, then

$$\int_1^{20} g(x) dx = \int_1^{-100} g(x) dx + \int_{-100}^{20} g(x) dx.$$

True

False

c. [2 points]

If h is an odd function and is continuous everywhere, then h is invertible.

True

False

d. [2 points]

If k is a differentiable function and is always concave up,

then $k'(a) \leq \frac{k(b) - k(a)}{b - a}$ whenever $a < b$.

True

False

e. [2 points]

If ℓ is a continuous function, then

$$\int_2^3 \ell(t) dt \leq \int_2^4 \ell(t) dt.$$

True

False

f. [2 points]

Suppose m is a twice differentiable function. If $m''(5) = 0$,
then m does not have an inflection point at $x = 5$.

True

False