1. (2 pts each) True or False? Answer "True" only if the statement is always true.

a) Circle True or False: If \( f(x) \) is a second degree polynomial, then \( f(f(x)) \) is also a second degree polynomial.

b) Circle True or False: \( e^{a+b} = e^a + e^b \)

c) Circle True or False: If \( f(x) \) is an exponential function, then \( f(x) \to \infty \) as \( x \to \infty \).

d) Circle True or False: \( \sin(\pi/3) + xe^{\ln(x)} + 1 \) is a linear function.

e) Circle True or False: The derivative of \( f(x) \) at a given point is the tangent line at that point.

f) Circle True or False: If \( a \) is positive, then the function \( a \cdot \ln(x) \) is concave down.

g) Circle True or False: If \( f'(x) \) is an increasing function on an interval, then \( f(x) \) is also increasing on that interval.

2. (6 pts) Sketch a graph of a single continuous function \( G(x) \) satisfying all of the following conditions:

i) \( G'(x) \) is always negative.

ii) When \( x < 0 \), \( G(x) \) is concave down

iii) When \( x > 0 \), \( G(x) \) is concave up.