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**: $sin(\pi/3) + x^{ln(e)} + 1$ 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 $a * ln(x)$ 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 $G(z)$ satisfying all of the following conditions:

i) $G'(z)$ is always negative.
ii) When $z < 0$, $G(z)$ is concave down
iii) When $z > 0$, $G(z)$ is concave up.