

1. [13 points] For each problem below, circle **ALL** of the statements that **MUST** be true. (The four parts (a)-(d) are independent of each other. No explanations are required.)
- a. [3 points] Suppose f is a differentiable function which is concave up on its entire domain, $(-\infty, \infty)$.
- $\lim_{x \rightarrow 1} f(x) = f(1)$.
 - $f(2) \geq f(1)$.
 - $f'(2) \geq f'(1)$.
- b. [3 points] Suppose that $h(t)$ gives the height of a ball, measured in feet above ground level, t seconds after it is thrown off a bridge. Assume that the derivative of h is given by the formula $h'(t) = -32t + 64$.
- The ball reaches its maximum height 2 seconds after being thrown.
 - The ball reaches a maximum height of 64 feet from the ground.
 - The bridge is 64 feet off the ground.
- c. [4 points] Suppose that A and B are positive constants and $A < B$.
- $(\ln e^A)(\ln e^B) = A + B$
 - $\ln(10^{-A}) < 0$
 - $\ln(A^2 + B) = 2 \ln A + \ln B$
 - $\log A < \log B$
- d. [3 points] Suppose that $f(x) = -Ae^{-Bx}$ for some positive constants A and B .
- $f'(x) > 0$ for all x
 - f' is increasing
 - f is increasing