1. (2 points each) **True or False.** Circle True only if the statement is always true.

(a) If f' is increasing, then f is increasing. T F

(b) If f is an exponential function, then $\frac{d}{dx}\ln f(x)$ is constant. T F

(c) If $f''(x) = 0$ for all x, then f is a constant function. T F

(d) There is a function f so that $f(x) > 0$, $f'(x) < 0$, and $f''(x) < 0$ for all x. T F

(e) If $f''(x) < 0$ for all x, then $f(x) \leq f(0) + f'(0)x$ T F

(f) If $f'(x) = 0$, then f has either a relative maximum or relative minimum at x. T F

2. (7 points) The function g has a continuous derivative whose values are given in the following table. There is no more than one critical point of g between any two consecutive x-values in the table.

Note that the table gives values of $g'(x)$, **NOT** $g(x)$.

x	0	1	2	3	4	5	6	7	8	9	10
$g'(x)$	-9	-2	2	1	-1	-3	-6	-5	-4	2	10

(a) Estimate the x-coordinates of the critical points of g for $0 < x < 10$.

$1 < x < 2$ or $x \approx 1.5$
$3 < x < 4$ or $x \approx 3.5$
$8 < x < 9$ or $x \approx 8.5$

(b) For each critical point found in part (a), determine if it corresponds to a local maximum or minimum of the function g. Be sure to explain.

For $x \approx 1.5$, there is a local min because g decreases to the left of the CP and increases to the right.

For $x \approx 3.5$, there is a local max because g increases to the left of the CP + increases to the right.

For $x \approx 8.5$, there is a local min since g decreases to the left of the CP + increases to the right.