1. For the following questions select true if the statement is *always* true, and false otherwise. Each question is worth 1 point.

   (a) If f is differentiable and $f'(p) = 0$ or $f'(p)$ is undefined, then $f(p)$ is either a local maximum or a local minimum.

   True False

   (b) For f a twice differentiable function, if f' is increasing, then f is concave up and increasing.

   True False

   (c) The global maximum of $f(x) = x^2$ on every closed interval is at one of the endpoints of the interval.

   True False

   (d) If $f(x)$ has an inverse function $g(x)$, then $g'(x) = 1/f'(x)$.

   True False

   (e) If a function is periodic with period c, then so is its derivative.

   True False

   (f) If $C(q)$ represents the cost of producing a quantity q of goods, then $C'(0)$ represents the fixed costs.

   True False

   (g) If a differentiable function $f(x)$ has a global maximum on the interval $0 \leq x \leq 10$ at $x = 0$, then $f'(x) \leq 0$ for $0 \leq x \leq 10$.

   True False

   (h) If $f(x)$ is differentiable and concave up, then $f'(a) < \frac{f(b)-f(a)}{b-a}$ for $a < b$.

   True False

   (i) If you zoom in with your calculator on the graph of $y = f(x)$ in a small interval around $x = 10$ and see a straight line, then the slope of that line equals the derivative $f'(10)$.

   True False

   (j) If $f'(x) \geq 0$ for all x, then $f(a) \leq f(b)$ whenever $a \leq b$.

   True False