

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