1. **For the following, no partial credit will be given.**

(a) State the limit definition of the derivative of the function $f(x)$. (1 points)

(b) Describe what $f'(x)$ represents for a function $f(x)$. (1 point)

(c) State the limit definition of continuity for a function $f(x)$ at $x = a$. (1 point)

(d) Describe what is means for a $f(x)$ function to be continuous at $x = a$. (1 point)

(e) State the constant multiple rule for differentiation: For $k$ a constant (1 point)

$$\frac{d}{dx}\Big(kf(x)\Big) =$$

(f) State the sum rule for differentiation. (1 point)

$$\frac{d}{dx}\Big(f(x) + g(x)\Big) =$$

(g) State the power rule for differentiation. (1 point)

$$\frac{d}{dx}\left(x^n\right) =$$

(h) For $k$ a constant, (1 point)

$$\frac{d}{dx}\left(k\right) =$$

(i) If $f'(a) < 0$, then $f(x)$ is _____ at $x = a$. (1 point)

(j) A local minimum occurs where _____ changes from

_____ to _____. (1 point)

(k) If $f''(a) > 0$, then at $x = a$, $f$ is _____ _____.

(l) If $f'(a) = 0$ and $f''(a) < 0$, then $f$ has a _____

_____ at $x = a$. (1 point)

(m) For a function $f(x)$, we look for possible extreme points (local max / min values)

by setting _____ = _____. (1 point)

(n) For a function $f(x)$, we look for possible inflection points by setting

_____ = _____. (1 point)

(o) If $x = a$ is a point of inflection, then _____

changes _____ at $x = a$. (1 point)

(p) If $p(x)$ is the demand function for a particular commodity, then the

revenue function $R(x) =$ _____. (1 point)

(q) If $C(x)$ is the cost function for a particular commodity and $R(x)$ is the revenue

function, then the profit function $P(x) =$ _____. (1 point)

(r) State the product rule for differentiation. (1 point)

$$\frac{d}{dx}\Big(f(x) \cdot g(x)\Big) =$$

(s) State the quotient rule for differentiation. (1 point)

$$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) =$$

(t) State the chain rule for differentiation. (1 point)

$$\frac{d}{dx}\Big(f\Big(g(x)\Big)\Big) =$$