Calc Medic Ultimate Justifications Guide

To justify that…	State/show that…
f is continuous at $x = a$	
f is differentiable at $x = a$	
f is increasing on the interval (a, b)	
f is decreasing on the interval (a, b)	
f has a critical point at $x = a$	
f has a relative minimum at $x = a$	
f has a relative maximum at $x = a$	
f is concave up on the interval (a, b)	
f is concave down on the interval (a, b)	
f has an inflection point at $x = a$	
f has an absolute minimum at $x = a$	
f has an absolute maximum at $x = a$	

$f(x) = k$ for some x on the interval [a,b]	
$f'(x) = k$ for some x on the interval (a, b)	
A particle is at rest at $t = k$	
A particle changes direction at $t = k$	
A particle is speeding up/slowing down at $t = k$	
A particle is moving away from/towards the origin at $t = k$.	
A tangent line approximation for $f(a)$ is an underestimate/overestimate for the true value of $f(a)$	
A right Riemann sum is an underapproximation/overapproximation for the area under a curve f between $x = a$ and $x = b$	
A left Riemann sum is an underapproximation/overapproximation for the area under a curve f between $x = a$ and $x = b$	
A trapezoidal approximation is an underapproximation/overapproximation for the area under a curve f between $x = a$ and $x = b$	