Math 181 Honors Quiz 3 Version A

1. State and prove the pythagorean theorem for a right triangle with legs of lengths a and b and hypotenuse of length c.

2. Use the δ-ϵ defintion of limit to verify that $\lim\limits_{x \to 4} \dfrac{1}{3 + \sqrt{x}} = \dfrac{1}{5}$.

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3. Use the δ-ϵ definition of limit to show that

$$\lim_{x \to a} f(x) = L \qquad \text{and} \qquad \lim_{x \to a} g(x) = M$$

implies

$$\lim_{x \to a} \big(f(x) + g(x)\big) = L + M.$$

4. Derive the slope of the line tangent to $f(x) = \sqrt{x}$ at the point $(x, f(x))$ where $x > 0$ using the method of appoximation by secants.