Quiz 1 Calculus 1 9/7/2018

1. Fill each blank below with a limit law justifying that equality. Each blank is worth 1 point.

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$$\lim_{x\to 2} 5x^2 - 3 \quad = \lim_{x\to 2}\left(5x^2\right) - \lim_{x\to 2} 3$$

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$$= 5\lim_{x\to 2}\left(x^2\right) - \lim_{x\to 2} 3$$

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$$= 5\left(\lim_{x\to 2} x\right)^2 - \lim_{x\to 2} 3$$

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$$= 5(2)^2 - \lim_{x\to 2} 3$$

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$$= 5\cdot 4 - 3$$

$$= 20 - 3$$

$$= 17$$

Algebraic Limit Properties **Calculus 1** **9/7/18**

Let a and c be constants. Then

Constant Law for Limits: $\lim\limits_{x \to a} k = k$

Law X for Limits: $\lim\limits_{x \to a} x = a$

And as long as $\lim\limits_{x \to a} f(x)$ and $\lim\limits_{x \to a} g(x)$ are real numbers,

Sum Law for Limits: $\lim\limits_{x \to a} \left[f(x) + g(x) \right] = \lim\limits_{x \to a} f(x) + \lim\limits_{x \to a} g(x)$

Difference Law for Limits: $\lim\limits_{x \to a} \left[f(x) - g(x) \right] = \lim\limits_{x \to a} f(x) - \lim\limits_{x \to a} g(x)$

Constant Multiple Law for Limits: $\lim\limits_{x \to a} \left[c \cdot f(x) \right] = c \cdot \lim\limits_{x \to a} f(x)$

Product Law for Limits: $\lim\limits_{x \to a} \left[f(x) \cdot g(x) \right] = \lim\limits_{x \to a} f(x) \cdot \lim\limits_{x \to a} g(x)$

Quotient Law for Limits:* $\lim\limits_{x \to a} \dfrac{f(x)}{g(x)} = \dfrac{\lim\limits_{x \to a} f(x)}{\lim\limits_{x \to a} g(x)}$

Power Law for Limits:** $\lim\limits_{x \to a} \left[f(x) \right]^{p/q} = \left[\lim\limits_{x \to a} f(x) \right]^{p/q}$

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* provided $\lim\limits_{x \to a} g(x) \neq 0$.

** provided $\lim\limits_{x \to a} f(x) \geq 0$ when q is even and $\lim\limits_{x \to a} f(x) \neq 0$ if $p/q < 0$.