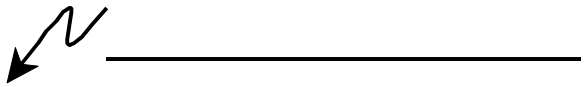
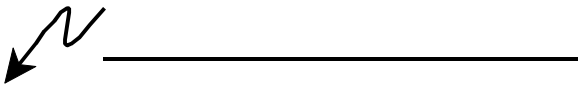
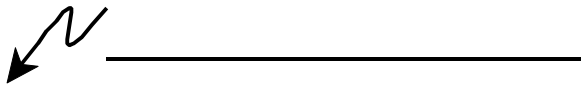
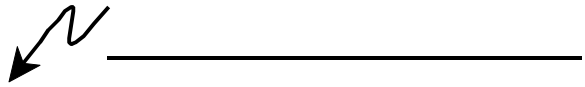
Quiz 1a Calculus 1 9/16/2011

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

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

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

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

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

$$= 3\cdot 4 - 5$$

$$= 12 - 5$$

$$= 7$$

Algebraic Limit Properties **Calculus 1** **9/13/11**

Let a and c be constants. Then

Constant Rule for Limits: $\lim_{x\to a} c = c$

Rule X for Limits: $\lim_{x\to a} x = a$

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

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

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

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

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

Quotient Rule for Limits: $\lim_{x\to a}\dfrac{f(x)}{g(x)} = \dfrac{\lim_{x\to a} f(x)}{\lim_{x\to a} g(x)}$ as long as $\lim_{x\to a} g(x) \neq 0$.

Power Rule for Limits: $\lim_{x\to a}\left[f(x)\right]^n = \left[\lim_{x\to a} f(x)\right]^n$