

Take Home Quiz (Due Friday)

Calculus
McGowan

$$f(x) = 6x^2 - 3x + 3$$

find $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$

(show all work)

$$f(x+h) = 6(x+h)^2 - 3(x+h) + 3$$

$$= 6(x^2 + 2xh + h^2) - 3x - 3h + 3$$

$$= 6x^2 + 12xh + 6h^2 - 3x - 3h + 3$$

$$-f(x) = -6x^2 + 3x - 3$$

} add

$$f(x+h) - f(x) = 12xh + 6h^2 - 3h$$

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = \lim_{h \rightarrow 0} \frac{12xh + 6h^2 - 3h}{h}$$

$$= \lim_{h \rightarrow 0} 12x + 6h - 3$$

$$= 12x - 3$$