FAR BEYOND

MAT122

Difference Quotient



Evaluating a Function - Review

Do: evaluate the following given $f(x) = 2x^2 - 5x + 1$ f(2)

$$f(x+h)$$

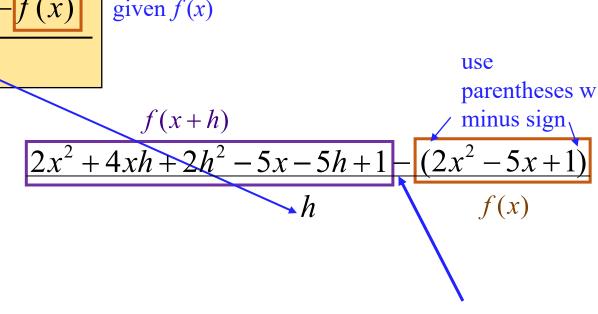
Difference Quotient

ex. find difference quotient of
$$f(x) = 2x^2 - 5x + 1$$

$$\frac{f(x+h)-f(x)}{h}$$
 given $f(x)$

from previous slide

get
$$f(x+h) = 2x^2 + 4xh + 2h^2 - 5x - 5h + 1$$



distribute negative

$$= \frac{2x^2 + 4xh + 2h^2 - 5x - 5h + 1 - 2x^2 + 5x - 1}{h}$$

$$= \frac{4xh + 2h^2 - 5h}{h}$$
 all terms in numerator will have an h

h – factor it out

$$=\frac{h(4x+2h-5)}{h(4x+2h-5)}$$
 $=4x+2h-5$

Goal for difference quotient:

Simplify enough to cancel *h* in denominator

Difference Quotient - Do

ex. find difference quotient of $f(x) = -7x^2 - 4x + 2$

$$\frac{f(x+h) - f(x)}{h}$$

$$= -14x - 7h - 4$$