Key

Support for College Algebra
Spring 2017
Quiz #4

SHOW ALL WORK QUIZ!

Find the ***Difference Quotient*** $\frac{f(x+h)-f(x)}{h}$ and simplify the following functions.

1.) $f(x) = 2x^2 - 5x + 1$

$$\frac{2(x+h)^2 - 5(x+h) + 1 - (2x^2 - 5x + 1)}{h}$$

$$2x^2 + 4xh + 2h^2 - 5x - 5h + 1 - 2x^2 + 5x - 1$$

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

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

2.) $g(x) = 3x^3 - x$

$$\frac{3(x+h)^3 - (x+h) - (3x^3 - x)}{h}$$

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

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

$$+ 9x^2h + 9xh^2 + 3h^3 - h$$

$$\frac{h(9x^2 + 9xh + 3h^2 - 1)}{h}$$

$$= \boxed{9x^2 + 9xh + 3h^2 - 1}$$

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Find the ***Difference Quotient*** $\frac{f(x+h)-f(x)}{h}$ and simplify the following functions.

1.) $f(x) = -5x^2 - 8x - 3$

$$\frac{-5(x+h)^2 - 8(x+h) - 3 - (-5x^2 - 8x - 3)}{h}$$

$$\frac{-5(x^2+2xh+h^2) - 8x - 8h - 3 + 5x^2 + 8x + 3}{h}$$

$$\frac{-5x^2 - 10xh - 5h^2 - 8x - 8h - 3 + 5x^2 + 8x + 3}{h}$$

$$\frac{-10xh - 5h^2 - 8h}{h}$$

$$\frac{h(-10x - 5h - 8)}{h} = \boxed{-10x - 5h - 8}$$

2.) $g(x) = 5x^3 + 2x$

$$\frac{5(x+h)^3 + 2(x+h) - (5x^3 + 2x)}{h}$$

$$5(x^2+2xh+h^2)(x+h) + 2x + 2h - 5x^3 - 2x$$

$$5(x^3 + 2x^2h + xh^2 + x^2h + 2xh^2 + h^3)$$

$$5x^3 + 10x^2h + 5xh^2 + 5x^2h + 10xh^2 + 5h^3 + 2x + 2h - 5x^3 - 2x$$

$$\frac{5x^3 + 10x^2h + 5xh^2 + 5x^2h + 10xh^2 + 2h}{h}$$

$$\frac{h(5x^3 + 10x^2 + 5xh + 5x^2 + 10xh + 2)}{h}$$

$$= \boxed{5x^3 + 15x^2 + 15xh + 2}$$