

July 13, 2015
 * Exam #2 - Thursday
 • 9-1 - 9.4
 • Exam #1

Jul 13-2:08 PM

$$\frac{f(x+h) - f(x)}{h} \quad \text{Difference Quotient}$$

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① $\frac{g(x+h) - g(x)}{h}$ for $g(x) = 3x - 4$

a.) $g(x+h) = 3(x+h) - 4$

b.) $g(x) = 3x - 4$

c.) $\frac{3(x+h) - 4 - (3x - 4)}{h}$

$$\frac{3x + 3h - 4 - 3x + 4}{h} = \frac{3h}{h} = 3$$

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② $\frac{f(x+h) - f(x)}{h}$ for $f(x) = \frac{x}{x+1}$

a.) $f(x+h) = \frac{(x+h)}{(x+h)+1}$

b.) $f(x) = \frac{x}{x+1}$

c.) $\frac{\frac{x+h}{(x+h)+1} - \frac{x}{x+1}}{h}$

LCD: $(x+h+1)(x+1)$

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

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

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

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

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

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$g(x) = \frac{1}{x^2}$

a.) $g(x+h) = \frac{1}{(x+h)^2}$

b.) $g(x) = \frac{1}{x^2}$

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

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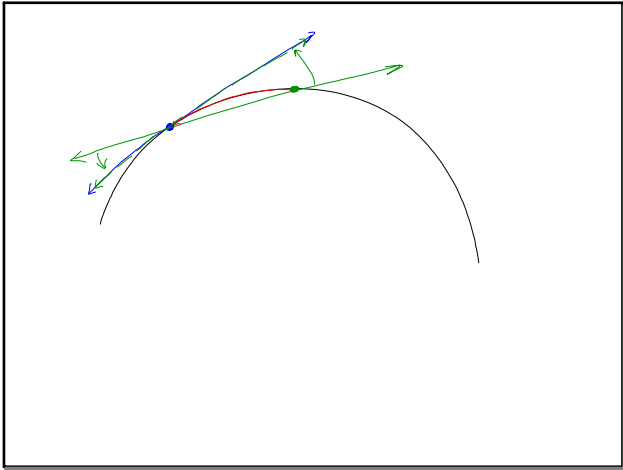
$$\frac{\frac{1}{x^2+2x+h^2} - \frac{1}{x^2}}{\frac{1}{h}}$$

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

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

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

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