Name: _____ **TC**

Classwork 26

1. **FUN with FUNction notation!!!**

a) Let $f(x) = 3x$ Find:

i. $f(2)$ ii. $f(5)$ iii. $f(n)$ iv. $f(c^2)$

b) Let $f(x) = 2x^2$ Find:

i. $f(4)$ ii. $f(a)$ iii. $f(x + 1)$ iv. $f(a + b)$

c) Let $f(x) = \sin x \log x$ Find:

i. $f(7)$ ii. $f(3 + x)$ iii. $f(x + h)$ iv. $f(z)$

d) $f(x) = x^5$ Find $f(x + 1)$.

2. Let's say we are dealing with the graph of $f(x) = \dfrac{\frac{1}{3}x^4 - 5x^2 + 1}{x^2 + 2x + 4}$

a) Investigate the slope around $x = 1$ using a chart.

First point		Second point		Δx "**h**"	Δ f(x)	slope
x	f(x)	x	f(x)			
1						

b) What is Δx approaching? What is Δf(x) approaching?

Why are we letting Δx go to 0?

b) Investigate the slope around $x = 5$ using the chart. This time, however, Δx is given.

First point		Second point		Δx **"h"**	Δ f(x)	slope
5				.8		
				.2		
				.1		
				.05		
				.001		
So in general, in terms of only **x** , **h**, and **f(x)....** **(A)** **(B)** **(C)** **(D)** **(E)** **(F)** **(G)**						
x						
First point		Second point		Δx **"h"**	Δ f(x)	slope

c) What did you do to find the function value for the first point?

Use that to write a general formula for box **(B)** above.

d) What did you do to find the x value of the second point?

Use that to write a general formula for box **(C)** above.

e) What did you do to find the y value of the second point?

Use that to write a general formula for box **(D)** above.

f) What did you do to find the $\Delta f(x)$?

Use that to write a general formula for box **(F)** above.

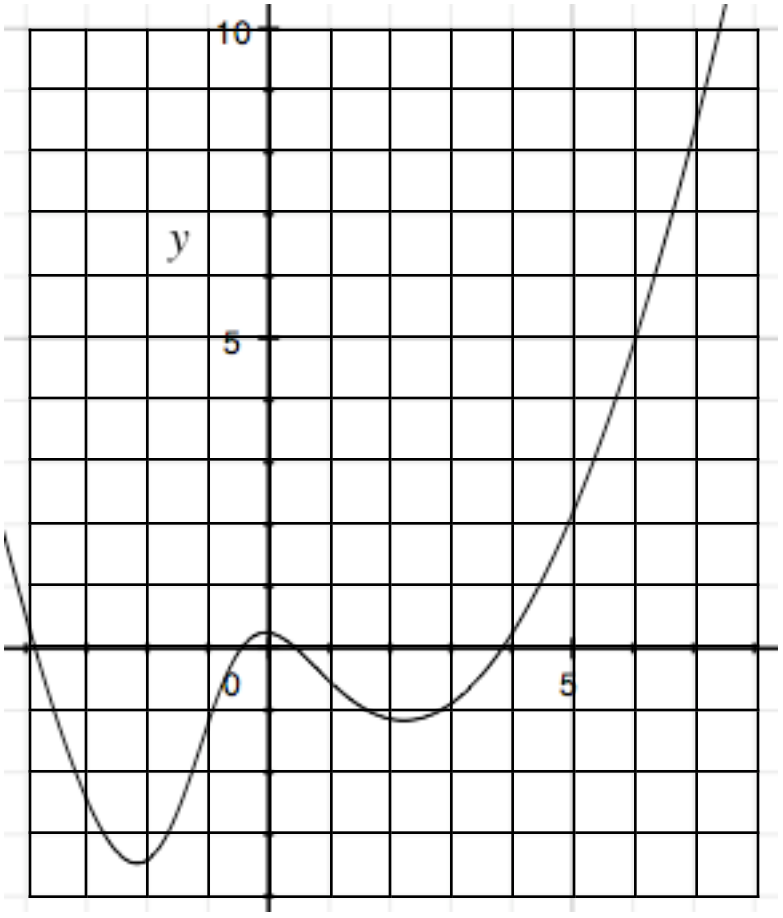
g) What did you do to find the slope?

Use that to write a general formula for box **(G)** above.

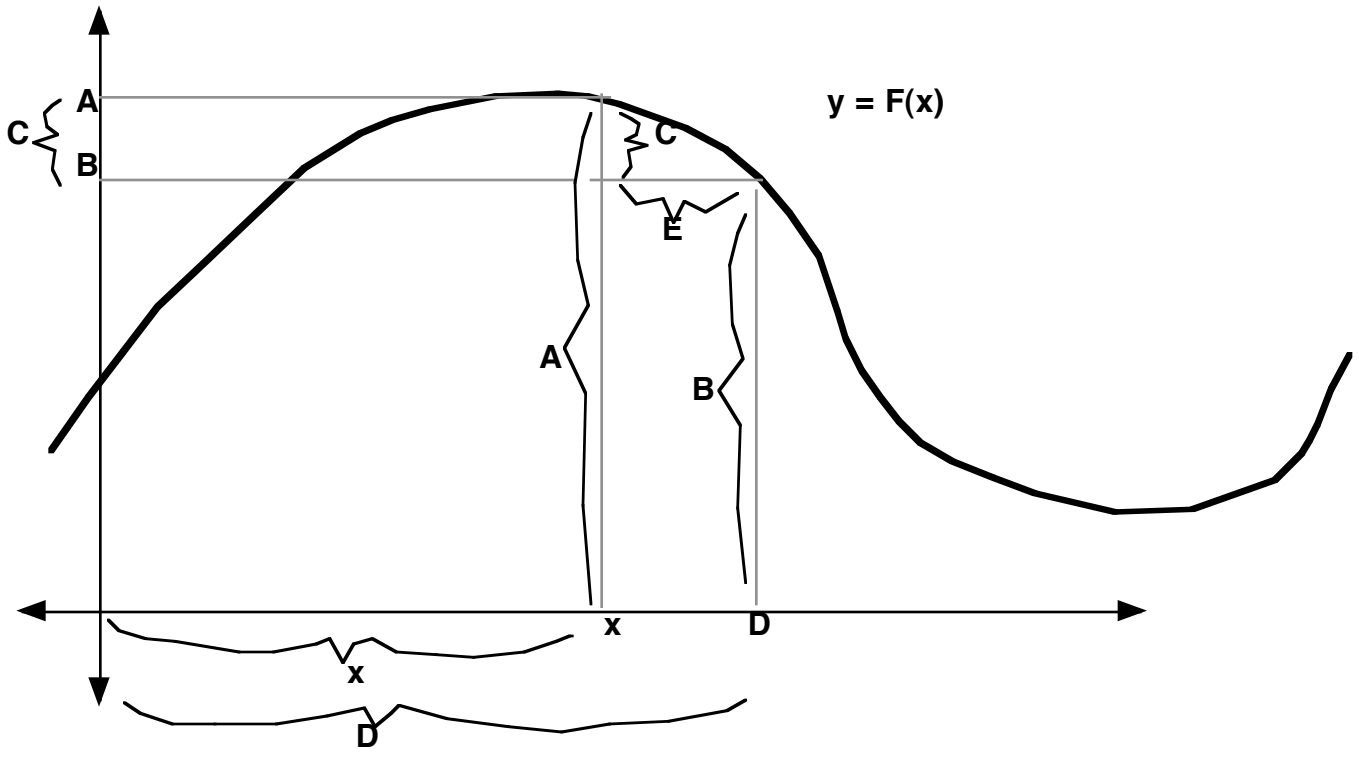
j) What are the only two pieces of information you needed to fill out the entire chart?

i) Write a limit to express the exact slopeat a point **x.**

Graph for #2



3.Label the drawing to show where each expression below goes (and what it represents).
1. F(x) 2. h 3. F(x + h) 4. x + h 5. F(x + h) - F(x)



Practice Problems

1. Use a small Δx near the point given to find the approximate slope.

a) $f(x) = 1/2x - 1 \quad x = 10$

b) $f(x) = x^3 - x \quad x = 2$

c) $f(x) = \log x \quad x = 2$

2. Evaluate each expression for $f(x) = x^3 / 2$

a) $f(3)$ b) $f(m)$ c) $f(x + 1)$ d) $f(x + h)$