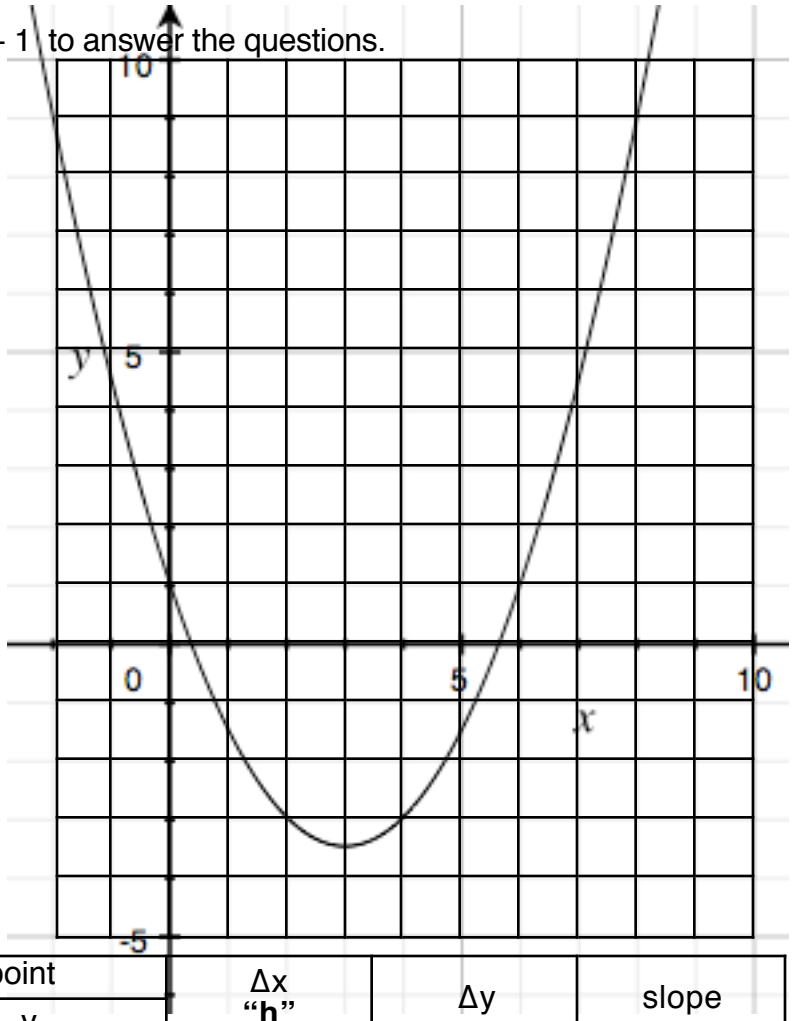
Name: _____ **TC**

Classwork 25

1. Use the graph below of $y = 1/2x^2 - 3x + 1$ to answer the questions.



a) Use the graph to approximate the slope at x = 6.

b) Use the graph to approximate the slope at x = 2

c) Use the graph to approximate the slope at x = 8

d) What could we do with a **table** to zoom in to a specific point and find the slope?

e) Approximate the slope at x = 6 by using a series of points near x = 6.

First point		Second point		Δx "**h**"	Δy	slope
x	y	x	y			
6		6.5				
6		6.1				
6		6.01				
6		6.001				

Δx **("h")** is approaching : Δy is approaching : Δx/Δy is approaching:

f)Approximate the slope near x = 2 by using the chart.

First point		Second point		Δx "**h**"	Δy	slope
x	y	x	y			
2		2.4				
2		2.1				
2						
2						

g) Finish the chart to approximate the slope near x = 8.

First point		Second point		Δx "h"	Δy	slope
x	y	x	y			

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						

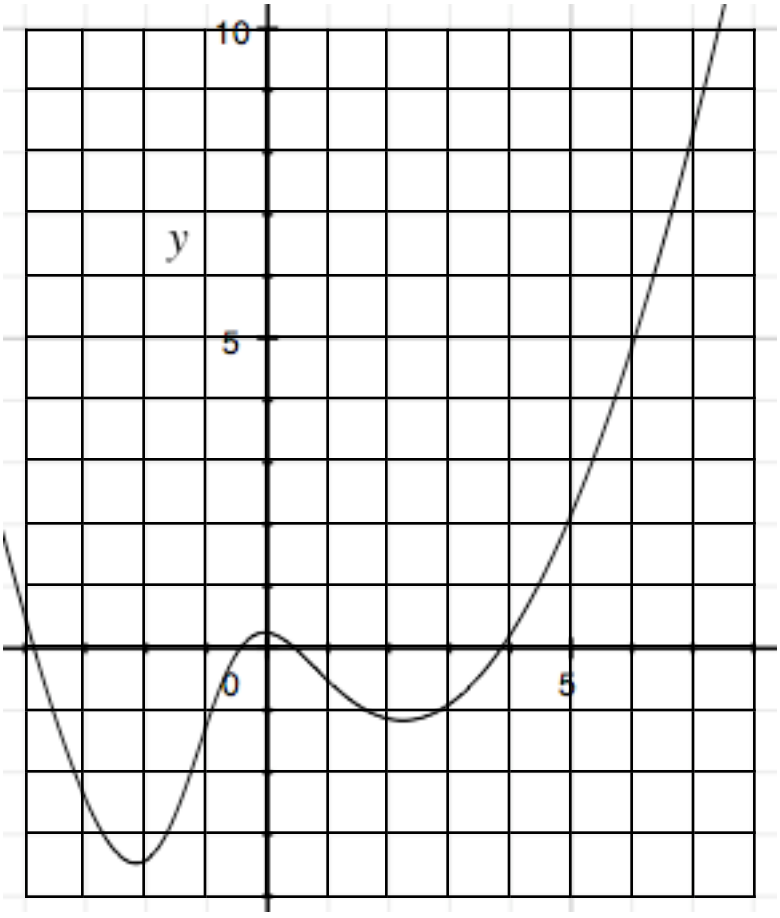
b) Investigate the slope around x = 5 using the chart. This time, however, Δx is given.

First point		Second point		Δx "h"	Δ f(x)	slope
5				.8		
				.2		
				.05		
				.001		
So in general, in terms of only **x** , **h**, and **f(x)....**						
x						

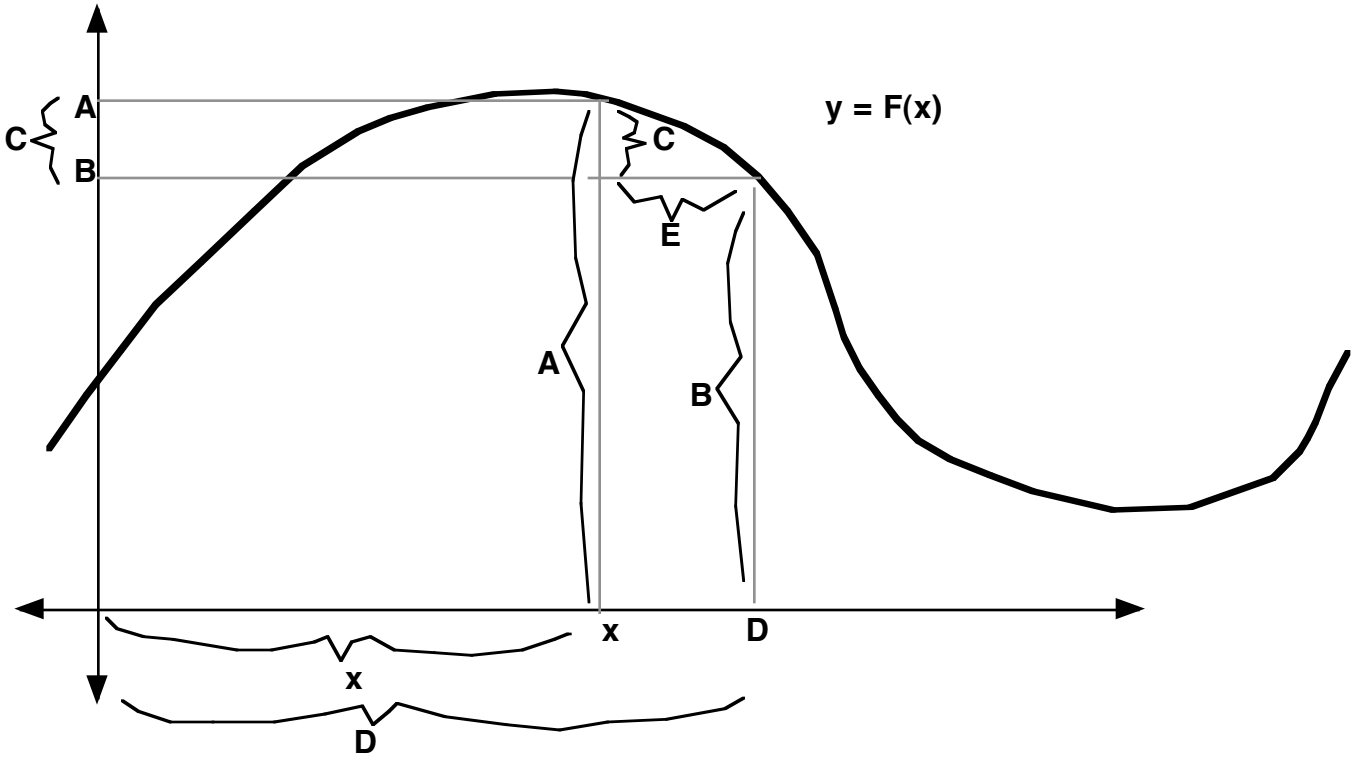
c) Use the graph on the next page to check your answers

d) Write a limit to express the exact slope at 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 Problem

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

a) $f(x) = 2x + 5 \qquad x = 8$

b) $f(x) = 2x^2 + 5x \qquad x = 1$

c) $f(x) = \cos x \qquad x = 8$