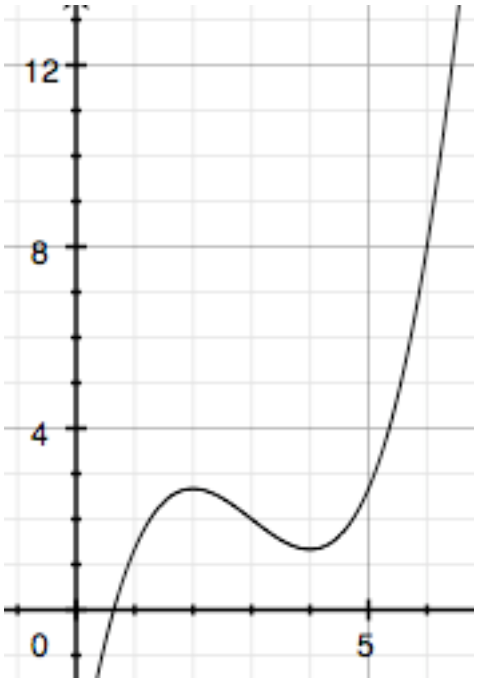
Name: _____

CLASSWORK 116

1. Lily is studying global warming. Each year, she tries to measure how fast the climate is warming, and she has come up with the following equation:

$$D = 1/3t^3 - 3t^2 + 8t - 4$$

where **D** is the **RATE of degrees per year** of warming & **t** is **years** after 2000. (t = 0 = 2000, t = 1 = 2001, etc.)



a) How fast was the climate warming in 2004? (t = 4)

b) According to the graph, during what range of time was the climate actually getting **colder?**

c) During what period of time did climate **delecerate?** (its rate of growth was going down.)

d) According to this equation, how many degrees did the earth's climate warm between 2002 and 2007?

e) What was the **average rate of change** over the time period in (d)?

2. Find the derivative of each function.

a) $y = \sin^2(4x)$

b) $y = x^3 \arctan x$

3. Use the chart below to answer the following questions.

x	f(x)	f'(x)	g(x)	g'(x)	h(x)	h'(x)
1	-4	2	6	-1	5	-2
2	-5	12	3	-2	1	-3
3	2	-5	4	-1	8	5
4	3	2	1/2	-5	4	7
5	6	0	5	-1/2	2	-1/4

a) Let $P(x) = f(x)g(x)$.

i. Find $P(3)$

ii. Find $P'(3)$

iii. Find $P'(4)$

b) Let $C(x) = f(h(x))$

i. Find $C(2)$

ii. Find $C'(1)$

iii. Find $C'(5)$

c) Let $J(x) = h(x)g(x) + f(x)$

i. Find $J(2)$

ii. Find $\Delta J(x)/\Delta x$ for $x = 3$ and $x = 5$

iii. Find $J'(4)$

4. At the Pizza π restaurant, you can pick three numbers, and their total will be the amount of money you have to pay for a pizza. The second number has to be the square of the first number, and the third number will be 10 minus the product of the first number and 5. What three numbers will give you the best price?