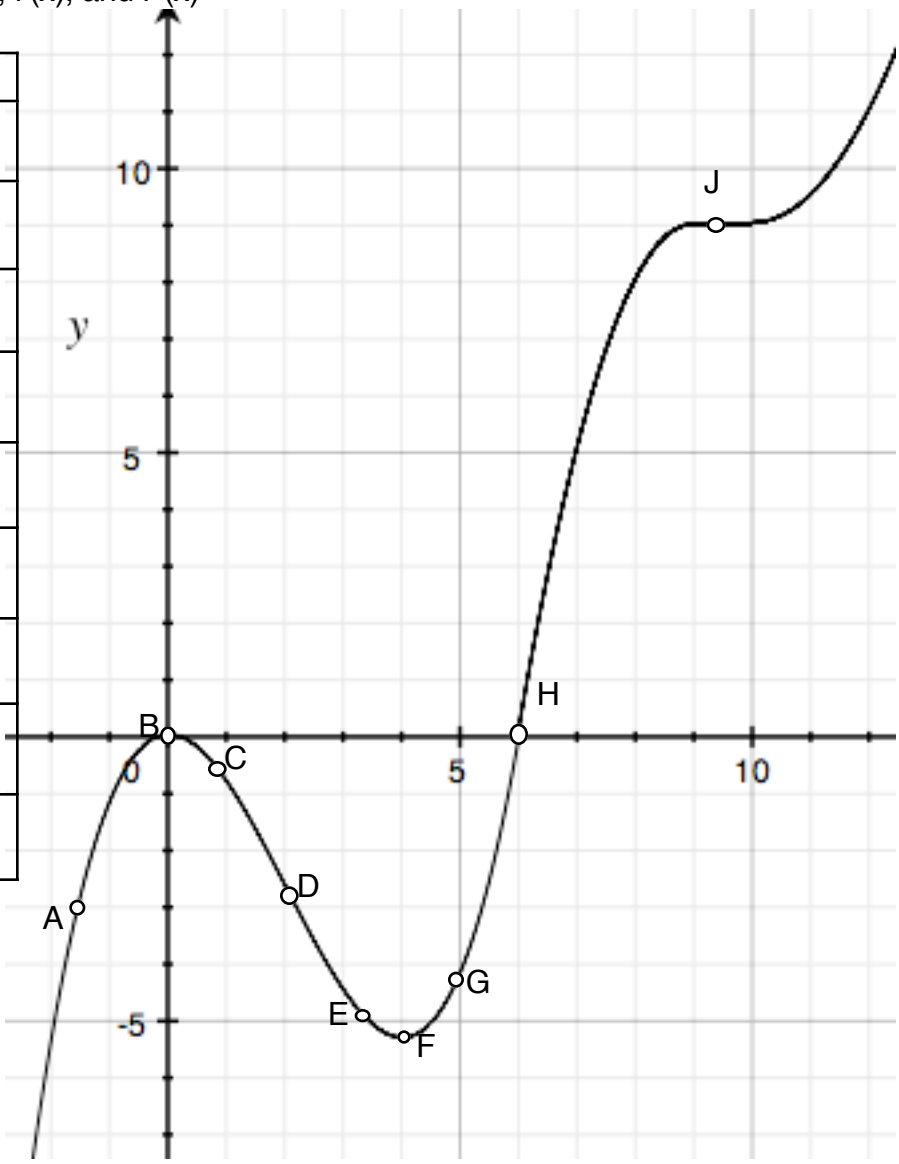
Name: _____

CLASSWORK 115

1. For each point, write +, -, or 0 for f(x), f'(x), and f''(x)

point	f(x)	f'(x)	f''(x)
A			
B			
C			
D			
E			
F			
G			
H			
J			



2. Many countries, including the U.S., have progressive income tax. This means that you pay a higher percentage of tax the more money you make.

a) Let's say that in the U.S., you pay 0% tax on your first $10,000 of income. You pay 5% the next $10,000 of income, 15% on the next $20,000 of income, 20% tax on the next $20,000 of income, and 35% on any income beyond that.

Under this system, calculate the amount of tax owed by people with the following incomes:

i) $22,000 ii) $54,000

b) Newton-land has a progressive tax system that is based on a mathematical equation (surprise!) The rate of tax you pay on the **nth** dollar you earn is given by **R =** $\sqrt{\frac{N}{100{,}000}}$

i) Find **rate** of tax on the \$10,000th dollar (how many cents of it goes to the government)

ii) Find the rate of tax on the \$75,000th dollar.

iii) Find the total amount of tax paid in Newton-land by a person who makes \$75,000.

3. Find $\lim_{x \to 4} \frac{x^2 - 7x + 12}{x - 4}$

4. Find the derivative of each function.

a) $y = 10x^3 - 4x + 7$

b) $y = \ln x \cos x$

c) $y = \cos (4x^3 - \sin x)$

d) $y = \sqrt[4]{\ln x}$

5. 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 $C'(5)$

6. 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?