Name: _____

CLASSWORK 60

1. a) Find the slope of $y = 1/2x^2 + x$ at $x = 4$.

b) Find the slope between $x = 4$ and $x = 4.001$ to show that your answer makes sense.

2. a) Find where the minimum of $y = 1/2x^2 + x$ occurs using calculus.

b) Evaluate the function at this point, 0.1 below it, and 0.1 above it to show that this is, in fact, the minimum.

3. Show that the fake product rule (just multiplying the derivatives) doesn't work for each function by simplifying and finding the derivative for real.

	"Fake" Product rule	Simplify and find the real derivative
a)	$y = (2x)(x^2)$	
b)	$y = (x)(1/x)$	

4. What rule **could** be used to find the derivative of a function that is composed of two functions multiplied?

7. Use the product rule to find the derivative of each function. Check your answer by simplifying and then taking the derivative.

PRODUCT RULE SIMPLIFY + OLD RULE

a) $f(x) = (1/x) \cdot 2x$

b) $f(x) = (3x)(7x)$

c) $f(x) = (4x^2)(5x^3)$

8. a) Use the product rule to find the derivative of $y = \sin x \cdot \cos x$

b) In the calculator, enter Y1 = $\sin x \cdot \cos x$
Have the calculator get its derivative like this Y2 = nDeriv (Y1, x, x)
Now, enter what you calculated for the derivative Y3 = ...

Are Y2 and Y3 the same? What does that mean?

c) Use calculus to find the EXACT answer for the slope of the curve at $x = \pi / 4$

d) What does the calculator give?

Is that the same answer?

9. a) Find the derivative of $y = x^3 \cos x$.

b) Find the slope of $y = x^3 \cos x$ at $x = 4$.

c) Use the calculator to check your answer.

10. A new topic..... Find

$\lim_{n\to\infty} \left(1 + \frac{1}{n}\right)^n$ using the calculator. What will the part inside the parentheses approach?

What will the exponent approach?

x	f(x)