Name: _____

CLASSWORK 78

Review and reinforcement!

1. Find the slope of the curve $y = \ln(3x - 5)$ at $x = 6$

2. Where does the graph of $y = \ln(3x - 5)$ have a slope of 6 ?

3. Find the derivative of $y = \tan x$.

Three more special derivatives....

1. a) Show, using the calculator if you want, that the derivative of $y = \arcsin x$ is $y' = \dfrac{1}{\sqrt{1 - x^2}}$

Remember, arcsin is $\sin^{-1}$ on your calculator.

b) What does the $\arcsin(\sin x)$ equal?

c) If $y = \arcsin(\sin x)$, what is y' ?

d) What identity relates the sine of an angle to its cosine?

e) Prove that the derivative in part (a) is correct.

2. a) Show, using the calculator if you want, that the derivative of $y = \arccos x$ is $y' = \dfrac{-1}{\sqrt{1 - x^2}}$
Remember, arcsin is $\cos^{-1}$ on your calculator.

b) What does the $\arccos (\cos x)$ equal?

c) If $y = \arccos (\cos x)$, what is y' ?

d) Prove that the derivative in part (a) is correct.
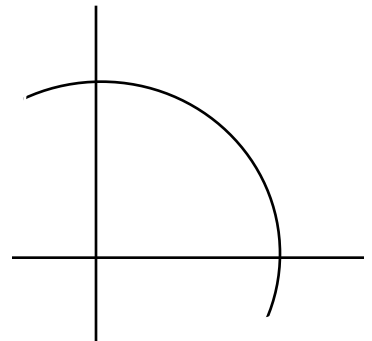
3. Show that the derivative of $y = \arctan x$ is $\dfrac{1}{1 + x^2}$

4. Find each derivative.

a) $y = \arctan (3x)$

b) $y = \arcsin (e^x)$

c) $y = \arccos (\ln x)$

d) $y = (\arctan x)^2$

A new topic!

5. Consider the equation $y^2 = x$.

a) Sketch a graph of this equation.

b) Is it a function? Explain.

c) Find $\dfrac{dy}{dx}$

d) Fill out the following chart showing the slope at each point of the equation.

x value	y value	SLOPE	x value	y value	SLOPE
(1	, 1)		(1	, -1)	
(4	, 2)		(4	, -2)	
(9	, 3)		(9	, -3)	
(16	, 4)		(16	, -4)	

e) Is it simpler to relate the slope to the x- value or to the y- value?

f) Write a relationship between the slope and the y- value.   Why does this relationship exist?

5. Consider the equation $y^3 - 1 = x$.

a) Find $\dfrac{dy}{dx}$

b) Fill out the following chart showing the slope at each point of the equation.

x value	y value	SLOPE at this pt.	x value	y value	SLOPE at this pt.
(0 , 1)			(124 , 5)		
(7 , 2)			(215 , 6)		
(26 , 3)			(342 , 7)		
(63 , 4)			(511 , 8)		

e) Write a relationship between the slope and the y- value.

f) Is it simpler to relate the slope to the x- value or to the y- value?

g) Why might the relationship in part (e) exist?