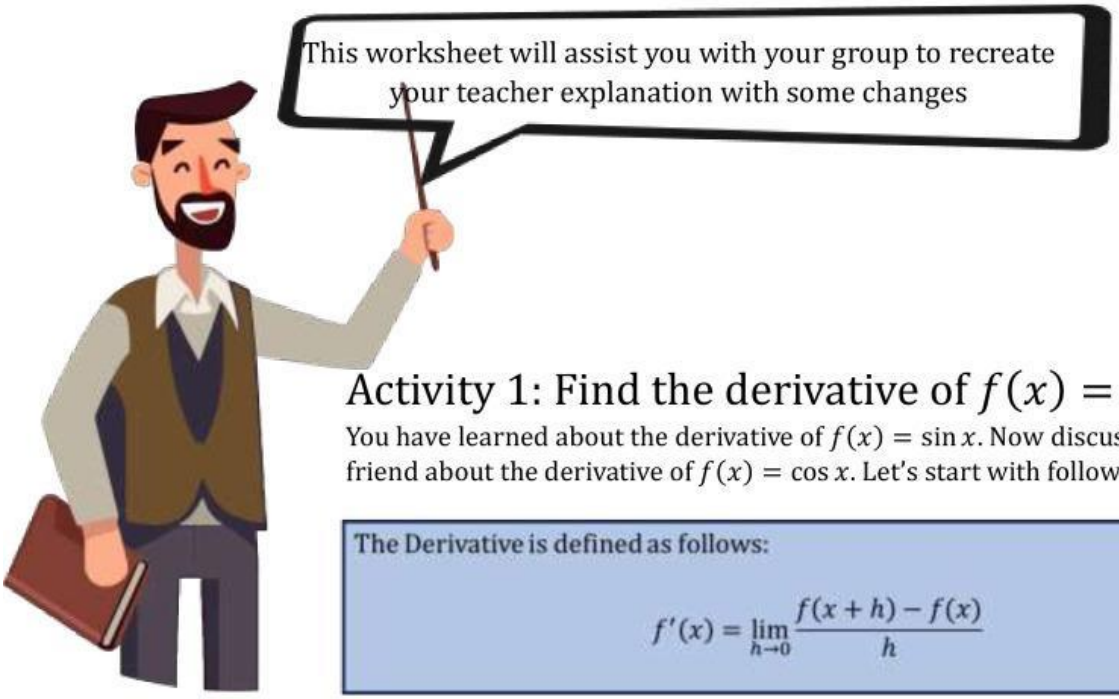

Activity 1: Find the derivative of $f(x) = \cos x$

You have learned about the derivative of $f(x) = \sin x$. Now discuss with your friend about the derivative of $f(x) = \cos x$. Let's start with following definition

The Derivative is defined as follows:

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

to help you working on this activity, please ponder following questions:

which one below that is useful to work on the derivative of $\cos x$? (Click on the correct answer)

$\sin(A+B) = \sin A \cos B + \cos A \sin B$	$\cos(A+B) = \cos A \cos B - \cos A \cos B$
$\sin(A-B) = \sin A \cos B - \cos A \sin B$	$\cos(A-B) = \cos A \cos B + \cos A \cos B$

In term of evaluate the limit in the definition, which in the below useful to work on the derivative of $\cos x$? (Click on the correct answer)

$\lim_{h \to 0} \frac{\cos h - 1}{h} = 0$	$\lim_{h \to 0} \frac{\sin h}{h} = 1$	Both are useful

In case you have done with the activity, which one below is your conclusion about the derivative of $f(x) = \cos x$

$f'(x) = \sin x$	$f'(x) = -\sin x$	$f(x) = -\cos x$

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Activity 2: Some Basic Problems

Based on your conclusion in Activity 1. Please work on the following problems

1. If $f(x) = \cos x$ what is $f'\left(\frac{\pi}{2}\right) =$ _____
2. What is the gradient of line g that tangent $f(x) = \cos x$ at point $\left(\frac{\pi}{2}, 0\right)$? _____
3. Which on in the following represent the equation of line g in problem number 2?

$y = -x + \frac{\pi}{2}$	$y = x - \frac{\pi}{2}$	$y = \frac{\pi}{2}x - 1$

Activity 3: Chain Rule Problems

CHAIN RULE

The chain rule states that the derivative of $f(g(x))$ is

$$f'(g(x)) \cdot g'(x)$$

Draw arrow to match following!

1. $f(x) = 5cos\ (5x + 11)$
2. $f(x) = \cos(2x^3 - 15)$
3. $f(x) = 6\cos^4 x$

A. $f'(x) = -24 \sin^3 x \cos x$
B. $f'(x) = -24 \sin^3 x$
C. $f(x) = -5 \sin(5x + 11)$
D. $f'(x) = -25 \sin(5x + 11)$
E. $f'(x) = 6 \cos^3 x$
F. $f'(x) = 24\cos^3 x$

LIVEWORKSHEETS