AP Calculus AB

Thursday, September 27, 2012

Derivatives test tomorrow

4. If $y=\frac{3x+4}{4x+3}$, then $\frac{\partial y}{\partial x}=$

A) $\frac{28x+25}{(4x+3)^2}$

B) $\frac{28x-25}{(4x+3)^2}$

C) $\frac{7}{(4x+3)^2}$

D) $\frac{-7}{(4x+3)^2}$

E) $\frac{3}{4}$

$$\frac{dy}{dx}=\frac{(4x+3)(3)-(3x+4)(4)}{(4x+3)^2}$$

$$\frac{dy}{dx}=\frac{12x+9-(12x+16)}{(4x+3)^2}$$

16. If the line tangent to the graph of the function f at the point (1,5) passes through the point (-3,-3) then $f'(1)$ is

f'(1) means the slope of f(x) @x=1.

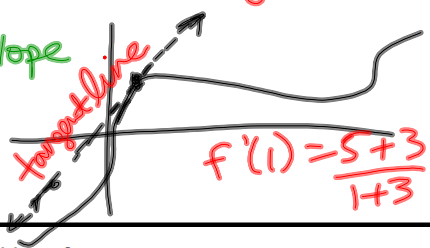
A) -2

B) -5

C) 1

D) 2

E) 5



$$f'(1)=\frac{5+3}{1+3}$$

24. Let the function defined by $f(x)=6x^3-4x+1$. Which of the following is an equation of the line tangent to the graph of f at the point where $\cancel{x}=1$?

$\rightarrow$ slope $\rightarrow$ derivative

A) $y=14x+2$

B) $y=14x-11$

C) $y=14x-17$

D) $y=18x-11$

E) $y=18x-15$

$f'(x)=18x^2-4$

$f'(1)=18-4=14 \rightarrow$ slope @x=1

$f(1)=6-4+1=3$

$y-3=14(x-1)$

$y=14x-14+3$

25. Find the equation of the line that is tangent to $f(x)=x^2-4x-7$ and parallel to $2x+y=4$. Show all work. (5 pts)

slope $\rightarrow$ derivative

$m=-2$

$f'(x)=2x-4$

Find x-value where slope is -2.

$2x-4=-2$

$x=1$

$f(1)=1-4-7=-10$

$m=-2$ point $(1,-10)$.

$y+10=-2(x-1)$

23. Given $f(x) = 2x^2 + x - 3$, find $f(x)$ by using the **definition of the derivative.** (*4 pts*)

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

16) Compute

Let $f(x) = \tan x$

$$f'\left(\frac{\pi}{4}\right) = \lim_{t \to 0} \left(\frac{\tan\left(\frac{1}{4}\pi + t\right) - \tan\left(\frac{1}{4}\pi\right)}{t} \right)$$

$$f'(x) = \sec^2 x$$

$$f'\left(\frac{\pi}{4}\right) = \left(\sec\frac{\pi}{4}\right)^2$$

$$f'\left(\frac{\pi}{4}\right) = \left(\frac{2}{\sqrt{2}}\right)^2$$

$$f'\left(\frac{\pi}{4}\right) = 2$$

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

$f'(x) = ?$

$$f(x) = \frac{3x+4}{5x-1}$$

Equation of tangent line of f(x) $= 2x^2 - 3x + \pi$

At the x-value of -1.

Equation of tangent line of f(x) $= \sin x$

At the x-value of $\pi/3$.

Find $g'(x)$ if $g(x) = x^2 \tan x$

$$h(x) = \frac{(3x^2+4x-7)(x^3-4x^2+2)}{(x^2-1)}$$

$h'(x) = ?$

$$h'(x) = \frac{(x^2-1)\left[(3x^2+4x-7)(3x^2-8x)+(x^3-4x^2+2)(6x+4)\right] - (3x^2+4x-7)(x^3-4x^2+2)(2x)}{(x^2-1)^2}$$