AP Calculus Mini Lesson

Some basic derivative rules

Have your notes & Booklet out Please.

The Power Rule

$$\frac{d}{dx}\left[x^n\right] = n x^{n-1}$$

ex $\frac{d}{dx} x^2 = 2x^1$

Some 'common sense' derivatives

Add to your formula booklet

$$\frac{d}{dx}c = 0 \quad (\textit{where } c \textit{ is a constant})$$

$$\frac{d}{dx}cx = c \quad (\textit{where } c \textit{ is a constant})$$

$\frac{d}{dx}[c * f(x)] = c * f'(x)$ [can "factor out" a constant]

$\frac{d}{dx}\left[3x^2\right] = 3 \cdot \frac{d}{dx}x^2 = 3 \cdot 2x = 6x$

$\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g(x)$ [derivative of a sum/diff is the sum/diff of derivatives]

Find the derivative when x=3 for each of the following:

$y = -\frac{4}{\sqrt[3]{x^1}} + \frac{1}{2x} - \pi$

make over

$-\frac{4}{x^{1/3}} + \frac{1}{2}\cdot\frac{1}{x} - \pi$

$-4x^{-1/3} + \frac{1}{2}x^{-1} - \pi$

power rule $-4\cdot-\frac{1}{3}x^{-4/3} + \frac{1}{2}\cdot-1x^{-2} - 0$

$f'(x) = \frac{4}{3}x^{-4/3} - \frac{1}{2}x^{-2}$

$\frac{4}{3\sqrt[3]{x^4}} - \frac{1}{2x^2}$ ← $-\frac{1}{2}\cdot\frac{1}{x^2}$

$f'(3) = \frac{4}{3}(3)^{-4/3} - \frac{1}{2}(3)^{-2}$

$f'(3) = 0.253$

$f(x) = \frac{\sqrt[3]{x^5}}{x^2} - \frac{2}{x}$

$f = \frac{x^{5/3}}{x^2} - 2x^{-1}$

$f = x^{-1/3} - 2x^{-1}$

calc.

$f' = -\frac{1}{3}x^{-4/3} - 2\cdot-1x^{-2}$

$f' = -\frac{1}{3\sqrt[3]{x^4}} + \frac{2}{x^2}$

$f'(3) = 0.299$

Finish the p. 114 hw
remember to check with calcchat.com for the odds