AP Calculus AB   Name_____
Opener 5.5 Day 1

Let's consider $f(x) = x^3 - 5x + 1$:

a. Find $f(2)$:   b. Find $f(2.1)$:

c. Find the equation of the tangent line to $f(x)$ at x=2.

d. Using the tangent line find the value of y when x = 2.1.

e. Now compare your results for b and d. Are the values close?

Given $f(4) = 2$ and $f'(4) = -3$, Estimate $f(4.01)$.

AP Calculus AB   Name_____
Opener 5.5 Day 1

Let's consider $f(x) = x^3 - 5x + 1$:

a. Find $f(2)$: -1 b. Find $f(2.1)$: $-.239$

c. Find the equation of the tangent line to $f(x)$ at x=2. point $(2, -1)$ slope $= f'(2)$
$$f'(x) = 3x^2 - 5$$
$$f'(2) = 3(2)^2 - 5 = 7$$
$$y + 1 = 7(x-2) \implies \boxed{y = 7(x-2) - 1}$$

d. Using the tangent line find the value of y when x = 2.1.
$$y + 1 = 7(2.1 - 2)$$
$$y = 7(2.1-2) - 1 = -.3 \text{ Yes!}$$

e. Now compare your results for b and d. Are the values close?
Yes! Good estimate.

Given $f(4) = 2$ and $f'(4) = -3$, Estimate $f(4.01)$.
point   slope @ x=4 $y - 2 = -3(x-4)$
$(4,2)$ $= -3$ $y \approx -3(4.01-4) + 2 = 1.97$