

son I
tangent line approximation - Class work

1

x	-1.5	-1.0	-0.5	0	0.5	1.0	1.5
$f(x)$	-1	-4	-6	-7	-6	-4	-1
$f'(x)$	-7	-5	-3	0	3	5	7

Let f be a function that is differentiable for all real numbers. The table above gives the values of f and its derivative f' for selected points x in the closed interval $-1.5 \leq x \leq 1.5$. The second derivative of f has the property that $f''(x) > 0$ for $-1.5 \leq x \leq 1.5$.

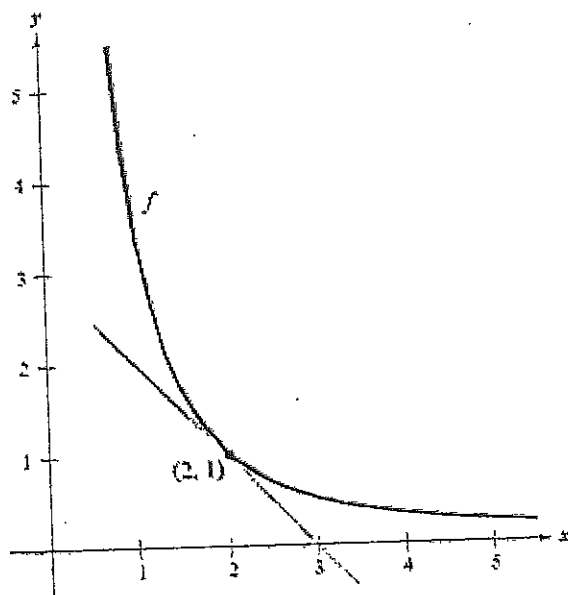
using the tangent line of $f(1)$ estimate the value of $f(1.2)$

2. Find the equation of the tangent line to $y = \sin x$ at the origin, and use it to find an estimation of $\sin 0.12$

3. Let f be a differentiable function. Estimate $f(2.1)$ given that $f(2) = 1$ and $f'(2) = 3$

4.

Use differentials and the graph of f to approximate (a) $f(1.9)$ and (b) $f(2.04)$.



AP Questions:

1998 AP Calculus AB Scoring Guidelines

4. Let f be a function with $f(1) = 4$ such that for all points (x, y) on the graph of f the slope is given by $\frac{3x^2 + 1}{2y}$.
- Find the slope of the graph of f at the point where $x = 1$.
 - Write an equation for the line tangent to the graph of f at $x = 1$ and use it to approximate $f(1.2)$.

1995 AB3

Consider the curve defined by $-8x^2 + 5xy + y^3 = -149$.

- GC
- Find $\frac{dy}{dx}$.
 - Write an equation for the line tangent to the curve at the point $(4, -1)$.
 - There is a number k so that the point $(4.2, k)$ is on the curve. Using the tangent line found in part (b), approximate the value of k .
 - Write an equation that can be solved to find the actual value of k so that the point $(4.2, k)$ is on the curve.
 - Solve the equation found in part (d) for the value of k .

AB7

Let f be the function defined by $f(x) = (1 + \tan x)^{\frac{3}{2}}$ for $-\frac{\pi}{4} < x < \frac{\pi}{2}$.

- Write an equation for the line tangent to the graph of f at the point where $x = 0$.
- Using the equation found in part (a), approximate $f(0.02)$.