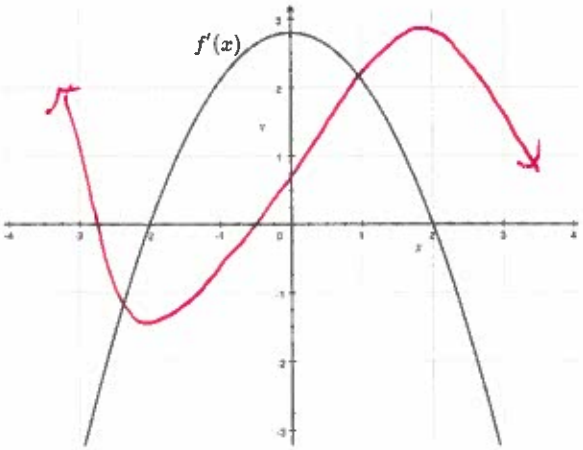
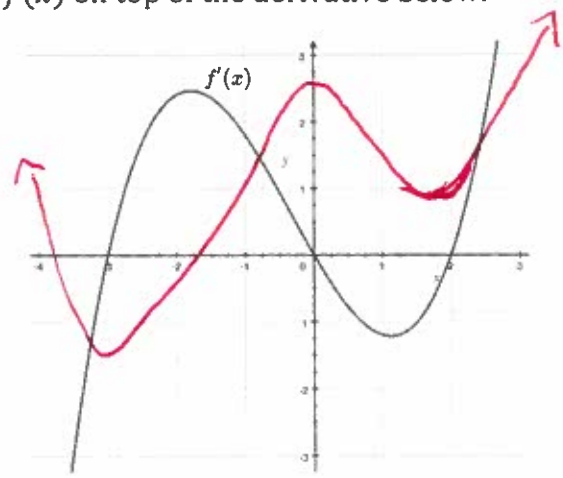
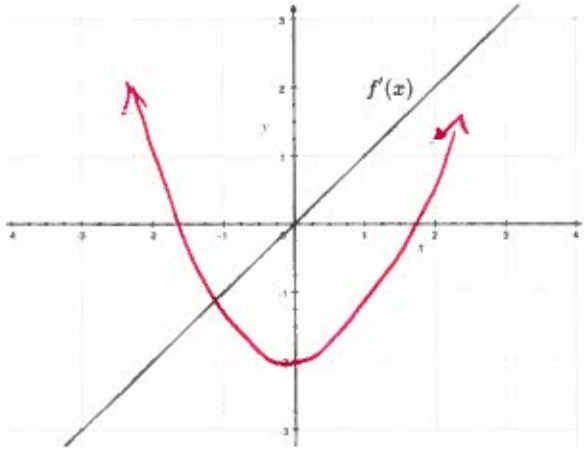
Who's happy when there's graphs and not numbers? Key

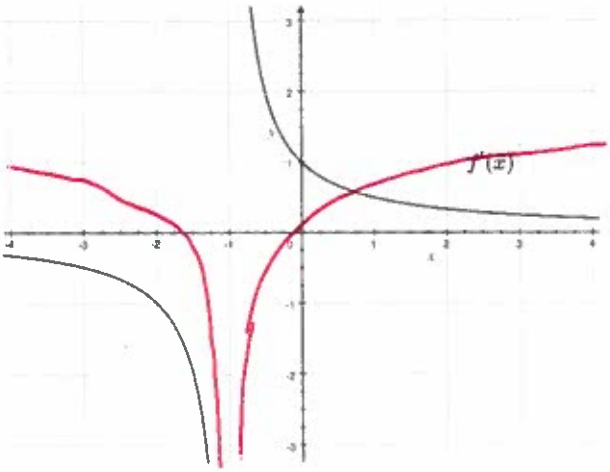
AP Calculus AB: 4.10 $f'(x)$ to $f(x)$ graphically

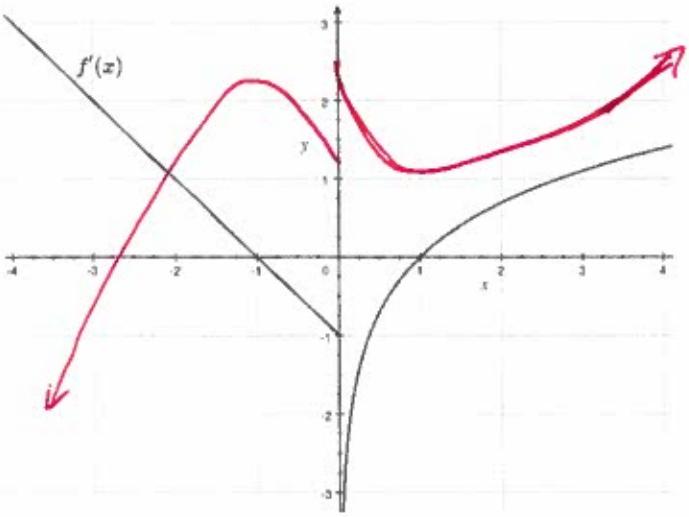
1.Graph a possible graph of the original function $f(x)$ on top of the derivative below.

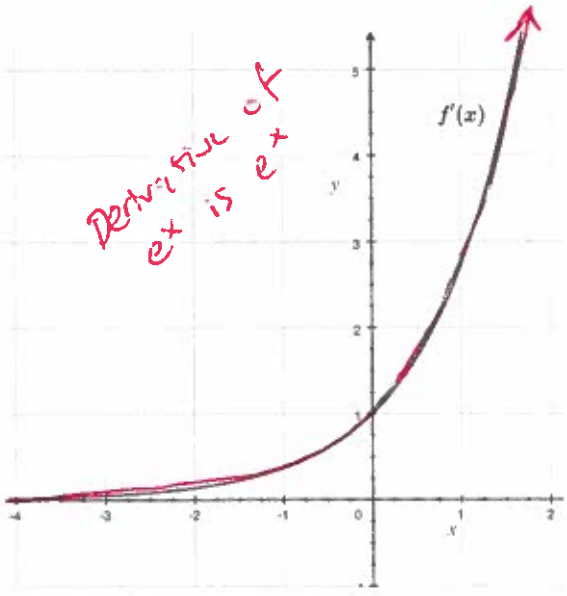












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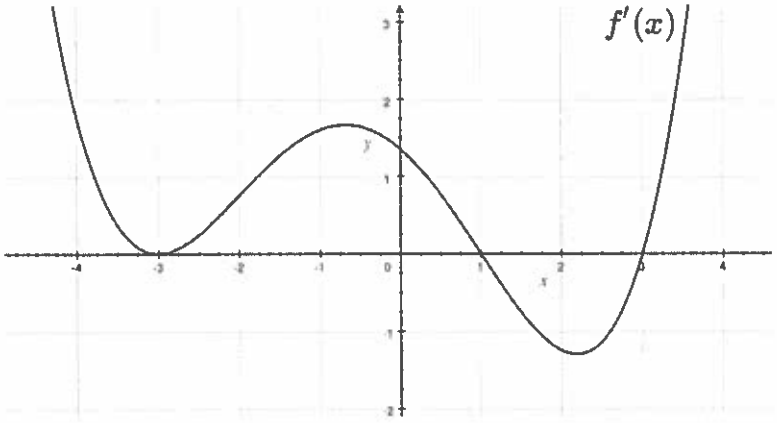


2. The graph above is a graph of the derivative of the function $f(x)$. Using the graph above answer the questions below.

a) On what interval(s) is the function $f(x)$ increasing? Justify.

$(-\infty, -3]\,[-3, 1]\,[3, \infty)$ because $f'(x)$ is +

b) At what x-values is there minimum on the graph of $f(x)$. Justify.

$x = 3$ because $f'(x)$ switches from − to +

c) On what interval(s) is the function $f(x)$ concave up? Justify.

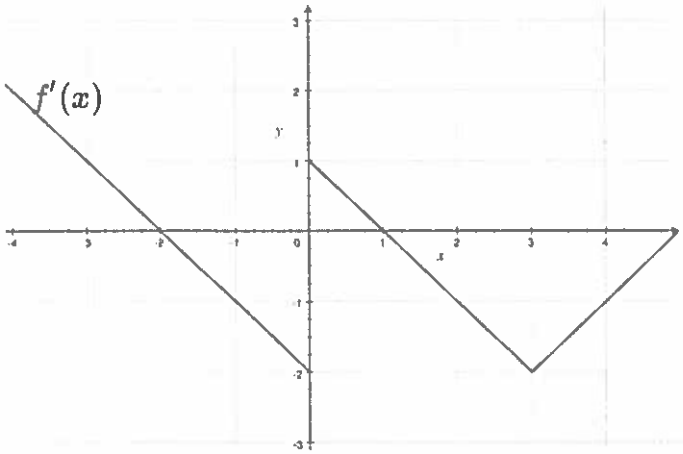
$(-3, -.75)\,(2.25, \infty)$ because $f'(x)$ is increasing

d) At what x-values is there a point of inflection on the graph of $f(x)$. Justify.

$x = -3, -.75, 2.25$ because $f'(x)$ switches from inc to dec.

e) Where on the graph of $f(x)$ is the function both concave down and decreasing?

$(1, 2.25)$ because $f'(x)$ is dec and negative (dec, neg)



3. The graph to the left is a graph of the derivative of function $f(x)$. Using the graph answer the questions below.

a) On what interval(s) is the function $f(x)$ increasing? Justify.

$(-\infty, -2]\,[0, 1]$ because $f'(x)$ is positive

b) At what x-values is there minimum on the graph of $f(x)$. Justify. None

c) On what interval(s) is the function $f(x)$ concave up? Justify.

$(3, \infty)$ because $f'(x)$ is increasing

d) At what x-values is there a point of inflection on the graph of $f(x)$. Justify.

$x = 3$ because $f'(x)$ switches from dec to inc

e) Where on the graph of $f(x)$ is the function both concave down and decreasing? (dec, neg)

$(-2, 0)\,(1, 3)$