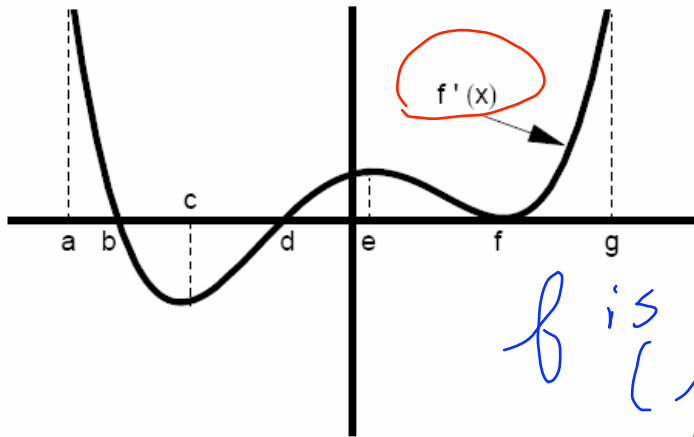


More of LHE 3.3

From: <http://www.frapanthers.com/teachers/zab/ABC Calculus Tests.htm>

Use the graph of $f'(x)$ below to answer the questions about $f(x)$. Note that the graph is of $f'(x)$, the derivative of $f(x)$, and **not** of $f(x)$.



f has c.v. at b, d, f ^{No Extremes}

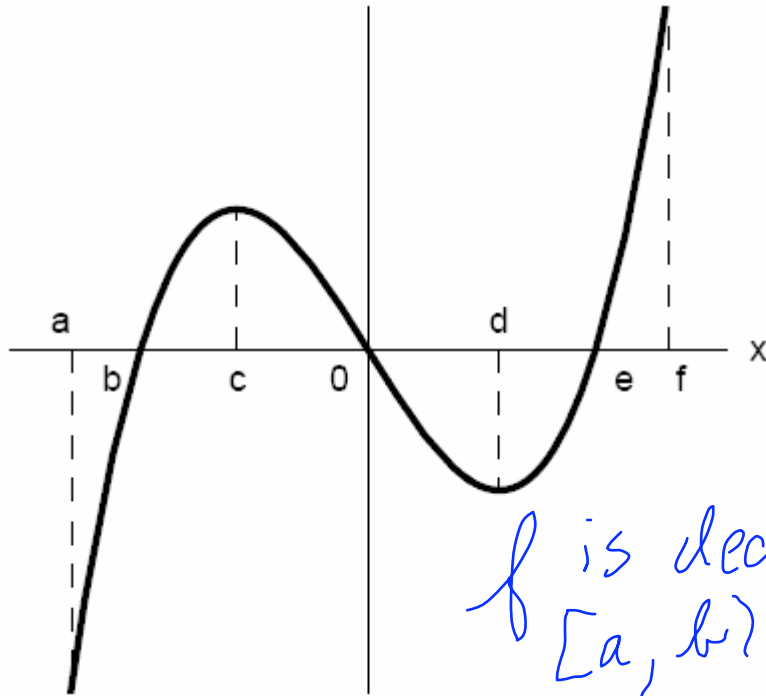
f is decreasing on (b, d) because $f' < 0$ on this interval.

Based on the graph of $f'(x)$ shown above find where the graph of $f(x)$ is increasing or decreasing AND find the x -values of any relative extrema.

at $x=b$ f' changes from positive to negative values. Hence f has a rel max at $x=b$
 at $x=d$ f' changes from neg to pos. Hence f has a rel min at $x=d$
 f is increasing on $[a, b)$,
 $(d, f) \cup (f, g]$
 because $f' > 0$ on these intervals

Another one

Let $y = f'(x)$ be the graph shown below



f has
CRITICAL
NUMBERS/VALUES

at
 $b, 0, e$

f is decreasing on
 $[a, b), (0, e)$
because $f' < 0$ on these
INTERVALS

Based on the graph of $f'(x)$ shown above find where the graph of $f(x)$ is increasing or decreasing AND find the x -values of any relative extrema.

At $x=b$ and $x=e$ f' changes
From neg to positive values Hence

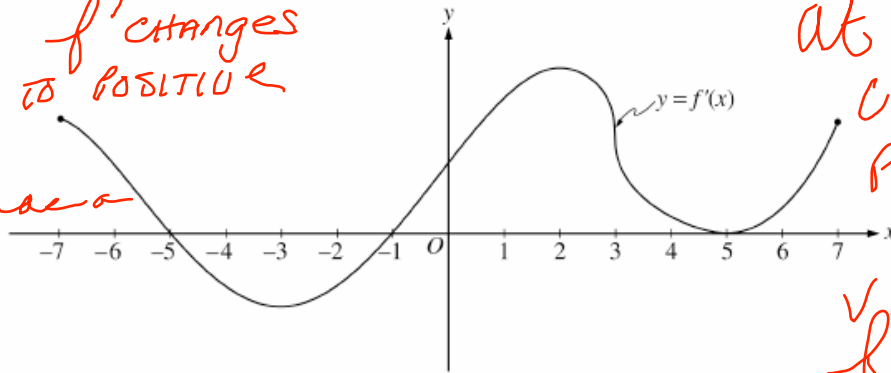
f has rel min at $x=b, x=e$

At $x=0$ f' changes from positive to
negative values Hence f has a
rel max at $x=0$

f increases on $(b, 0), (e, f]$ because
 $f' > 0$ on these INTERVALS

2000 AP® CALCULUS AB FREE-RESPONSE QUESTIONS

At $x = -1$ f' changes from neg to positive values.
Hence f has a rel min at $x = -1$

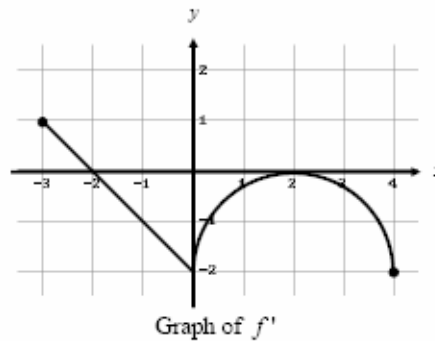


at $x = -5$ f' changes from pos to negative values Hence f has a rel max at $x = -5$

3. The figure above shows the graph of f' , the derivative of the function f , for $-7 \leq x \leq 7$. The graph of f' has horizontal tangent lines at $x = -3$, $x = 2$, and $x = 5$, and a vertical tangent line at $x = 3$.
- (a) Find all values of x , for $-7 < x < 7$, at which f attains a relative minimum. Justify your answer.
- (b) Find all values of x , for $-7 < x < 7$, at which f attains a relative maximum. Justify your answer.

from: <http://chaoticgolf.com>

Example: [2003 AP Calculus AB Free Response #4 ... No Calculator Allowed] Let f be a function defined on the closed interval $-3 \leq x \leq 4$ with $f(0) = 3$. The graph of f' , the derivative of f , consists of one line segment and a semicircle, as shown below.



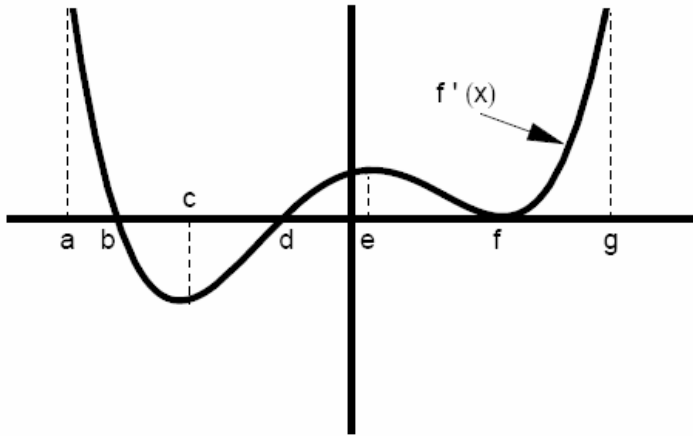
- a) On what intervals, if any, is f increasing? Justify your answer.

on $[-3, -2)$ $f' > 0$ Hence f is INCREASING ON THIS INTERVAL 😊

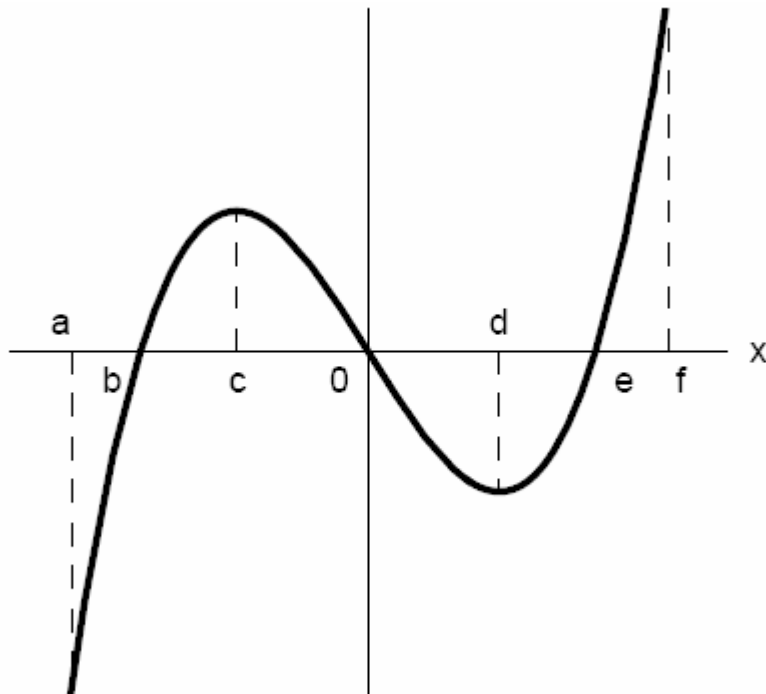
Now let's consider page 187 #62, 64 *easy peasy lemon squeezy!*
Homework: pages 186, 187 #33, 37, 47 [use your TI on #47], 61, 63

LHE 3.3 day two handout

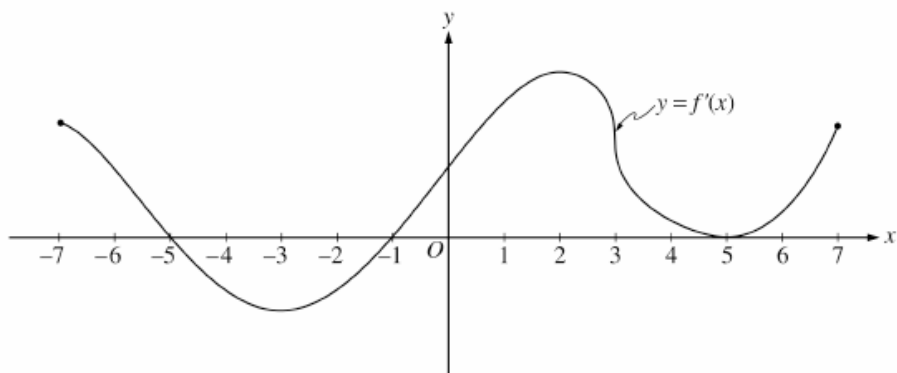
Use the graph of $f'(x)$ below to answer the questions about $f(x)$. Note that the graph is of $f'(x)$, the derivative of $f(x)$, and **not** of $f(x)$.



Let $y = f'(x)$ be the graph shown below

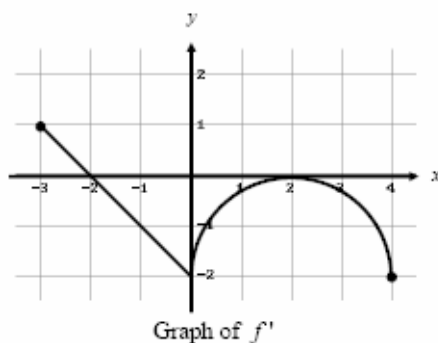


2000 AP[®] CALCULUS AB FREE-RESPONSE QUESTIONS



3. The figure above shows the graph of f' , the derivative of the function f , for $-7 \leq x \leq 7$. The graph of f' has horizontal tangent lines at $x = -3$, $x = 2$, and $x = 5$, and a vertical tangent line at $x = 3$.
- (a) Find all values of x , for $-7 < x < 7$, at which f attains a relative minimum. Justify your answer.
- (b) Find all values of x , for $-7 < x < 7$, at which f attains a relative maximum. Justify your answer.

Example: [2003 AP Calculus AB Free Response #4 ... No Calculator Allowed] Let f be a function defined on the closed interval $-3 \leq x \leq 4$ with $f(0) = 3$. The graph of f' , the derivative of f , consists of one line segment and a semicircle, as shown below.



- a) On what intervals, if any, is f increasing? Justify your answer.