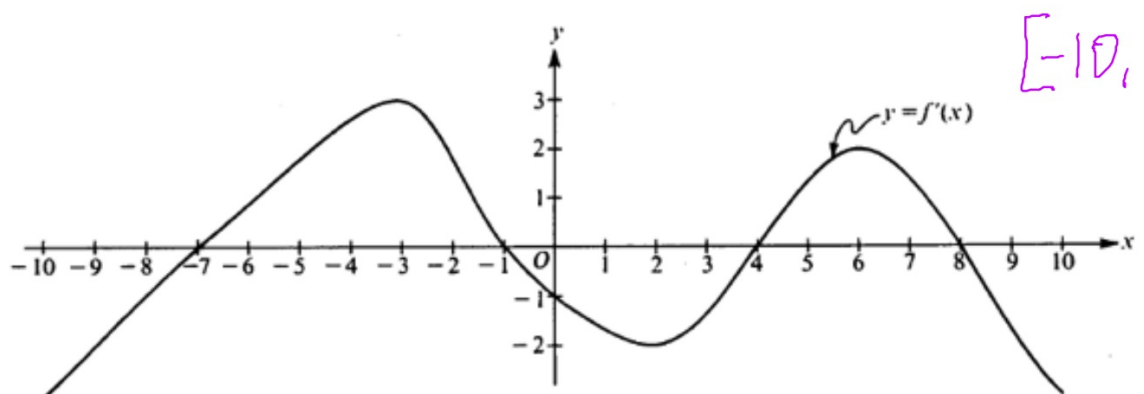


Interpreting Derivative Graphs

HW: worksheet posted on the website

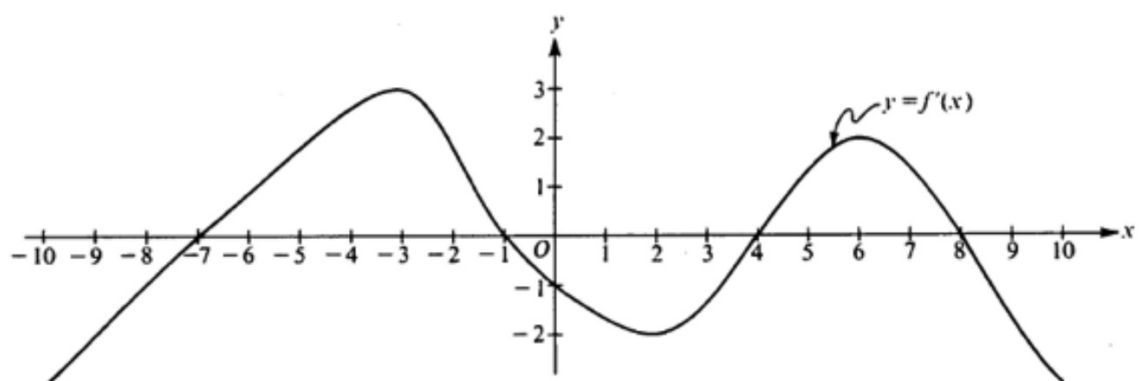
Derivative Graphs WS (second page)



Note: This is the graph of the derivative of f , not the graph of f .

Is $f(x)$ differentiable on the entire interval?

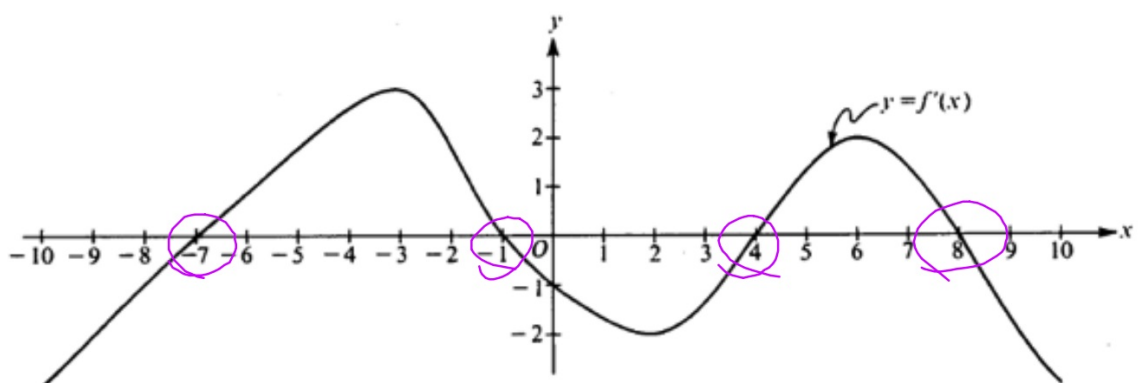
Yes; $f'(x)$ is continuous



Note: This is the graph of the derivative of f , not the graph of f .

Is $f(x)$ continuous on the entire interval?

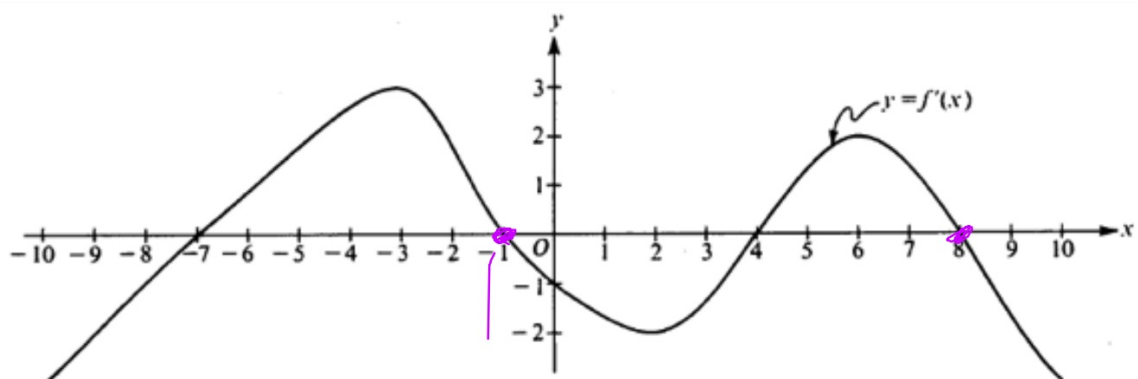
Yes because $f'(x)$ is continuous



Note: This is the graph of the derivative of f , not the graph of f .

Where is the derivative zero?

$x = -7, -1, 4, \text{ and } 8$ because $f'(x) = 0$ at these values

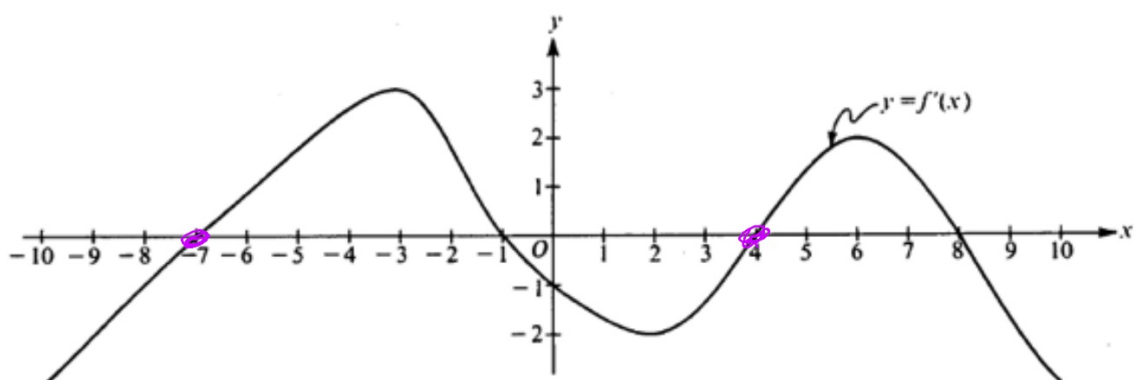


Note: This is the graph of the derivative of f , not the graph of f .

+ / -

Where is there a relative maximum?

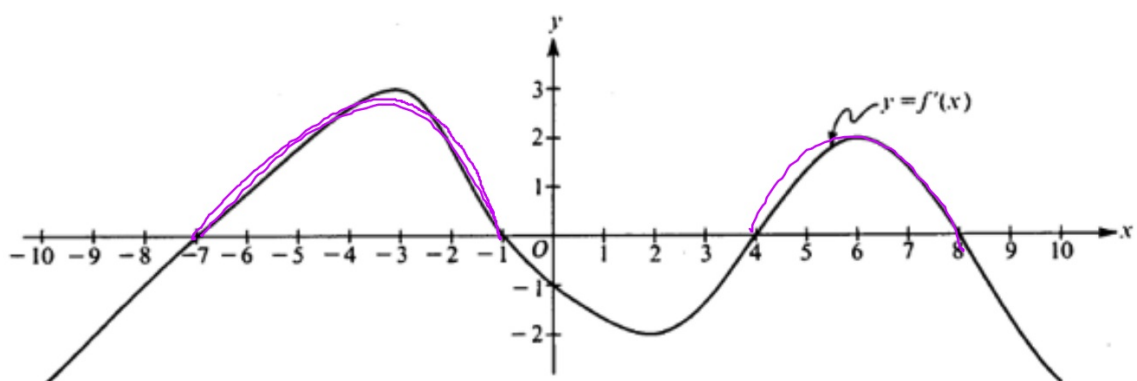
$x = -1$ and $x = 8$ because f' changes from positive to negative at these values



Note: This is the graph of the derivative of f , not the graph of f .

Where is there a relative minimum? $-/+$

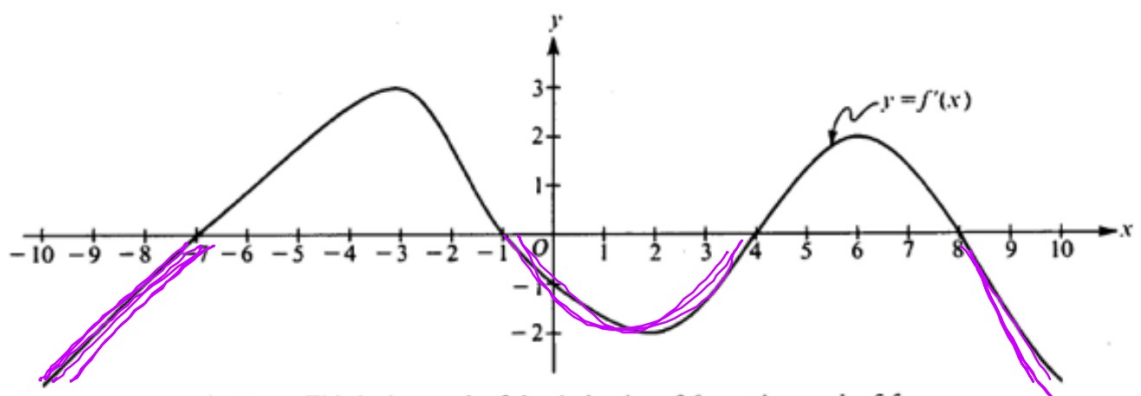
$x = -7$ and $x = -4$ because f' changes from negative to positive at these values



Note: This is the graph of the derivative of f , not the graph of f .

Where is $f(x)$ increasing? **look for $f' > 0$**

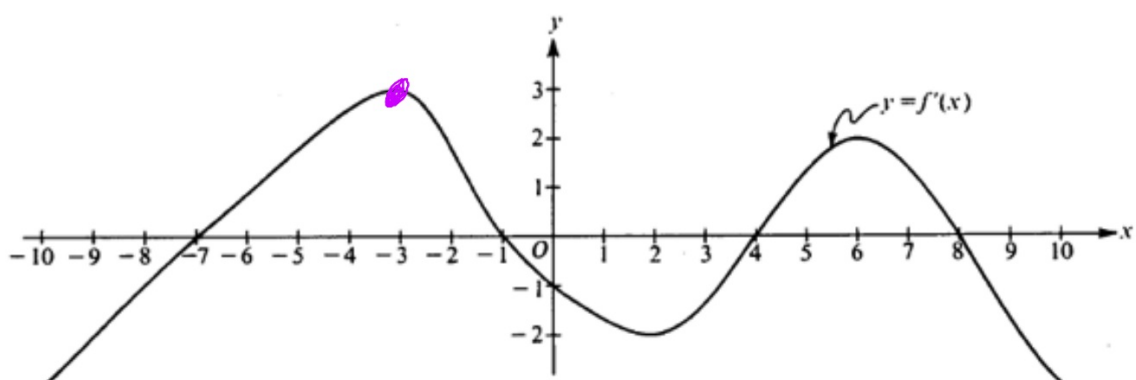
$(-7, -1)$ and $(4, 8)$ because $f' > 0$ on these intervals



Note: This is the graph of the derivative of f , not the graph of f .

Where is $f(x)$ decreasing?

$(-10, -7) \cup (-1, 4) \cup (8, 10)$ because $f' < 0$ on these intervals

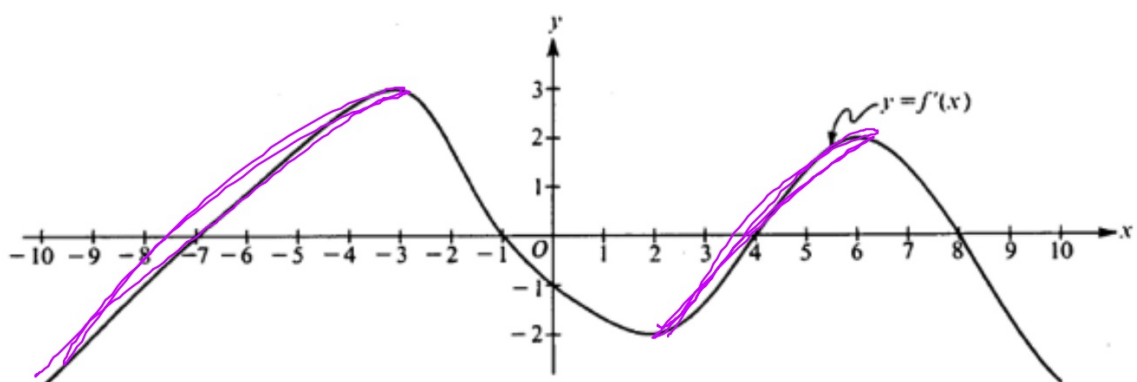


Note: This is the graph of the derivative of f , not the graph of f .

Where are there point(s) of inflection? **look for rel. extrema of f'**

$x = -3, 2,$ and 6 because f' has rel. extrema at these points

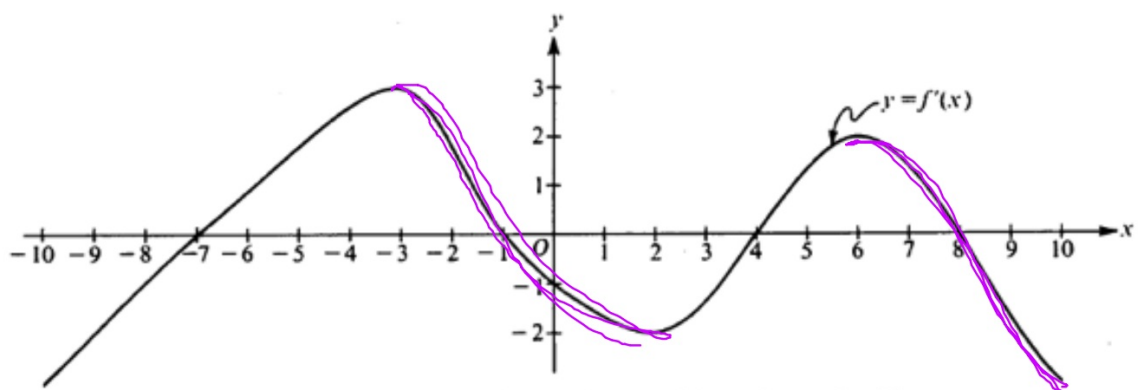
***OR f' is changing from inc/dec or dec/inc OR
the slope of f' is changing from pos./neg or neg./pos.***



Note: This is the graph of the derivative of f , not the graph of f .

Where is $f(x)$ concave up? **look for slope of $f' > 0$**

$(-10, -3) \cup (2, 6)$ because the slope of $f' > 0$ OR f' is increasing on these intervals

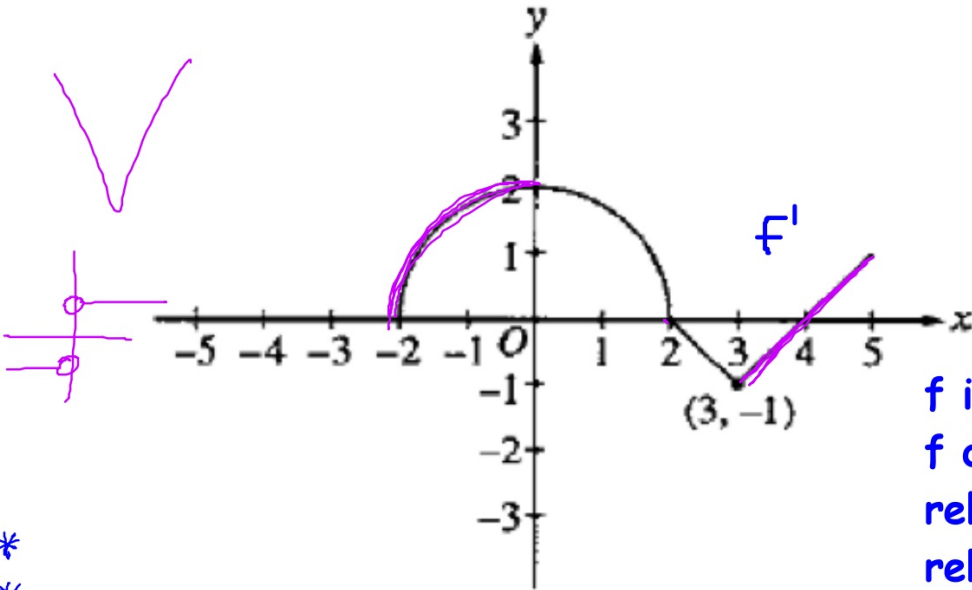


Note: This is the graph of the derivative of f , not the graph of f .

Where is $f(x)$ concave down? **slope of f' is negative**

$(-3, 2)$ and $(6, 10)$ because the slope of $f' < 0$ on these intervals

$[-2, 5]$



f incr $(-2, 2) \cup (4, 5)$
f dec $(2, 4)$
rel max $x = 2$
rel min $x = 4$
POI $x = 0, 3$
CCU $(-2, 0) \cup (3, 5)$
CCD $(0, 3)$

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