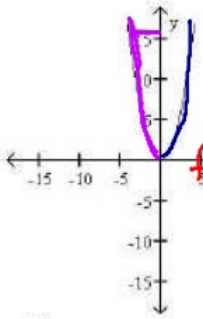
What you'll Learn About

- How to graph the derivative from the original function
- How to graph the function from the derivative

The graph of a function is given. Choose the answer that represents the graph of its derivative.

1)



f(x) Decreasing $(-\infty, 0) \rightarrow f'(x) < 0$ (neg) → below x-axis

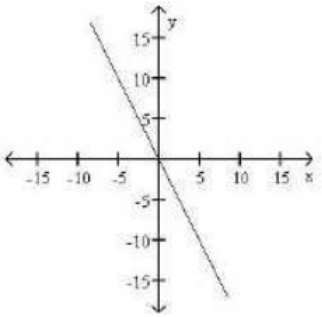
f(x) Increasing $(0, \infty) \rightarrow f'(x) > 0$ (pos) → above x-axis

f(x) Horizontal Tangent at $(0,0) \rightarrow f'(x) = 0$ (zero) → x-int

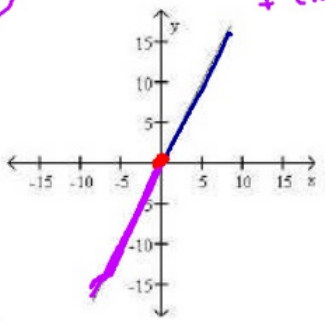
(minimum/maximum)

Slopes	Graph f'(x)
(neg)	below x-axis
(pos)	above x-axis
(zero)	x-int

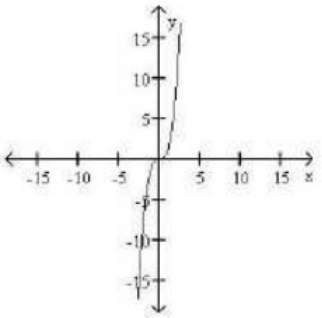
A)



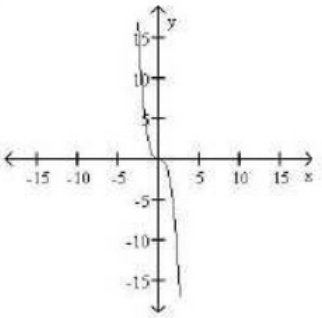
B) f'(x)



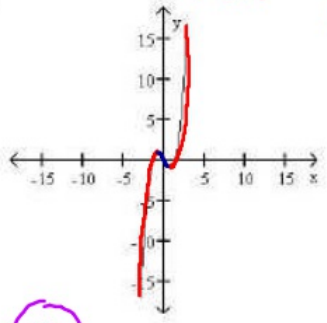
C)



D)



2)

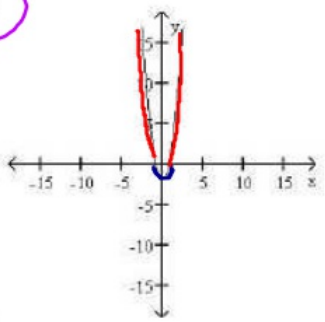


$(1,\infty) \cup (-\infty,-1)$ inc f' graph above x-axis

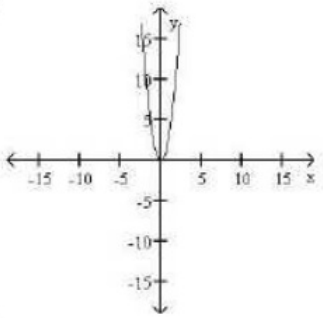
$(-1,1)$ dec f' graph below

H.T. $x=-1, 1$ f' graph x-int

A)



B)



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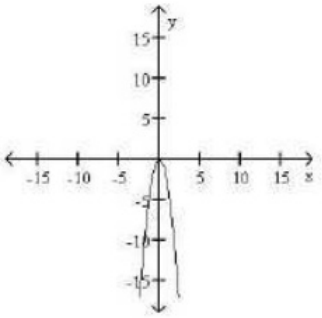

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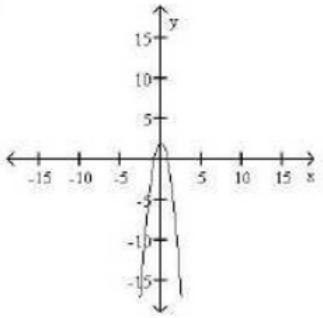

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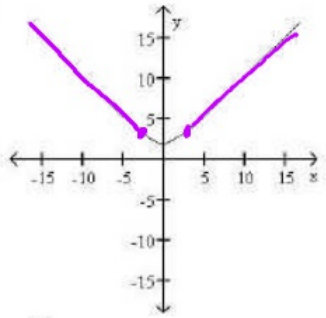
y
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-15 -10 -5 5 10 15 x
-5
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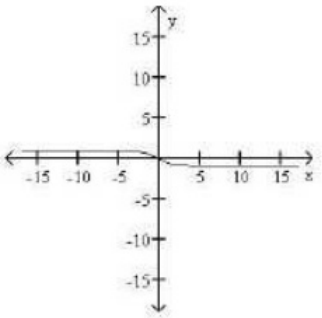
A)


y
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-15 -10 -5 5 10 15 x
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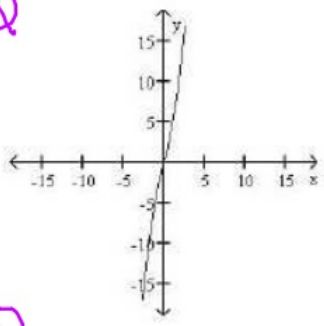
B)


y
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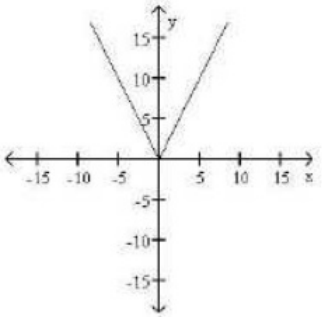
C)


y
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-15 -10 -5 5 10 15 x
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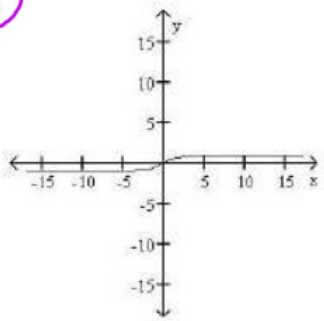
D)


y
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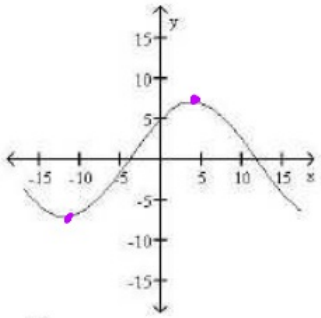
4)


y
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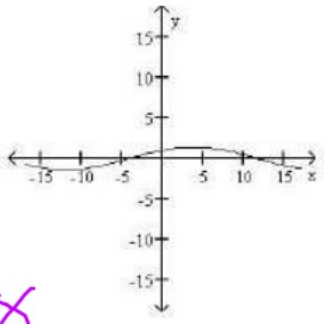
A)


y
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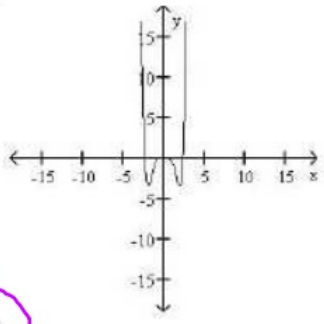
B)


y
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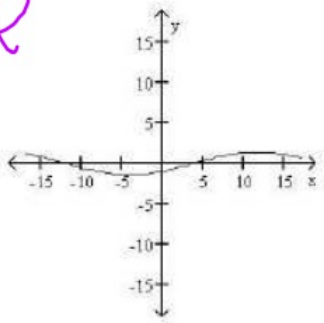
C)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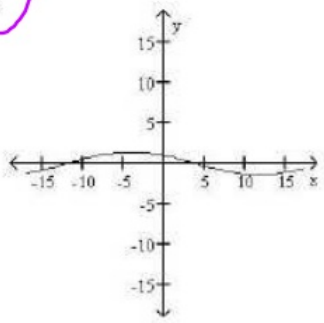
D)


y
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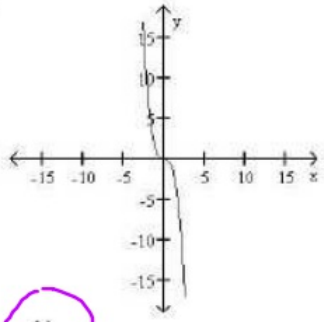
5)


y
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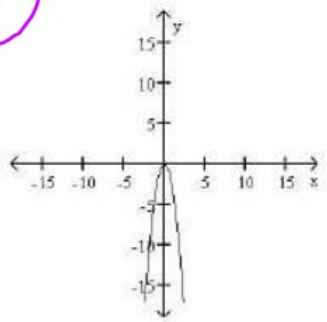
A)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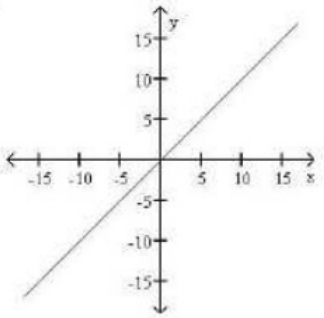
B)


y
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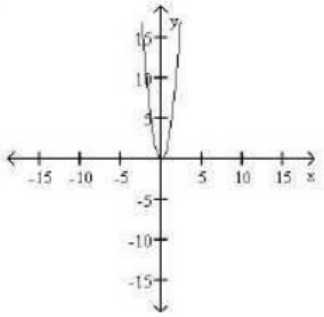
C)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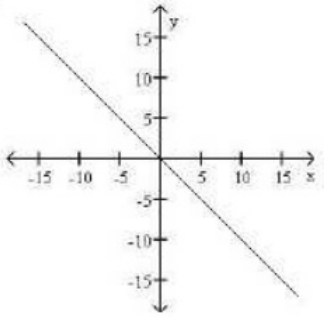
D)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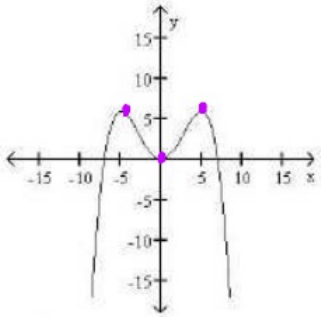
6)


y
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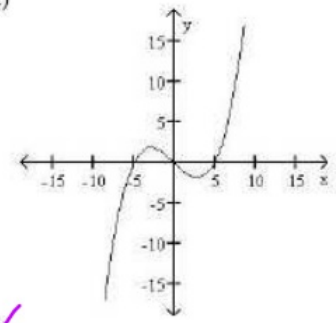
A)


y
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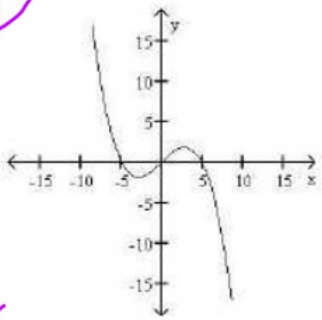
B)


y
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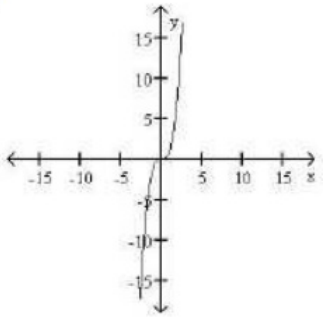
C)


y
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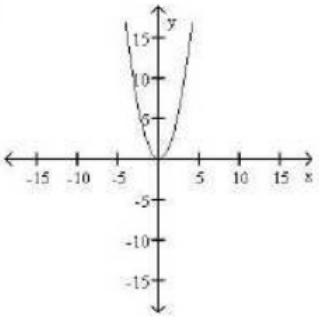
D)


y
x
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-5
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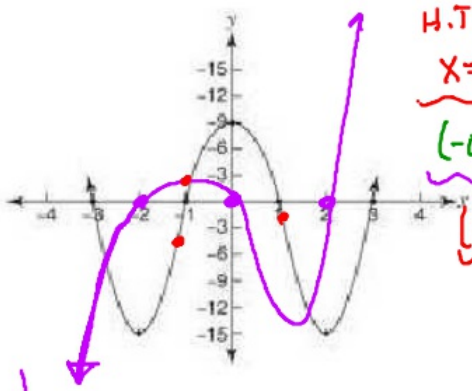
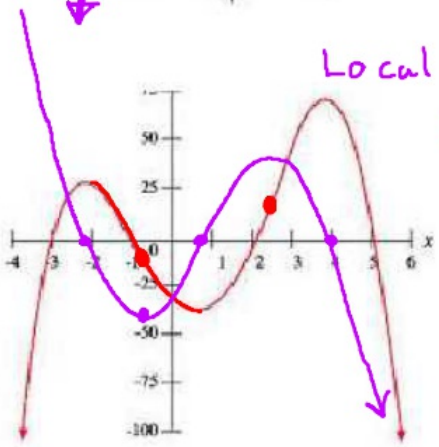
sketching slopes

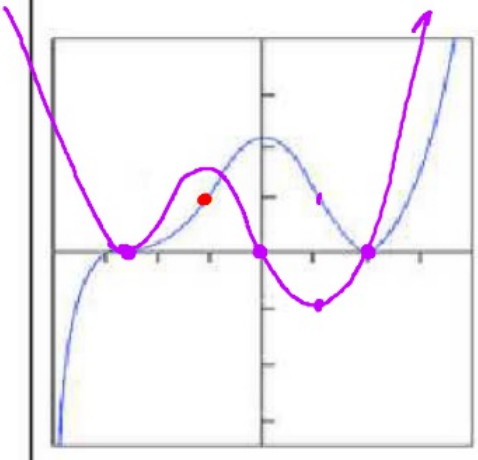
Sketch $f'(x)$ on the same coordinate plane as the given graph of f(x)



f(x)	f'(x)
H.T (max/min) x = -2, 0, 2	x-int x = -2, 0, 2
(-∞, -2) dec	below x-axis
(-2, 0) inc	above x-axis



Local Max/Min on f' are when the slope of f(x) is the steepest

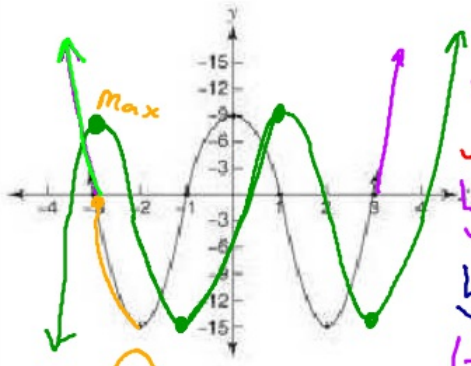


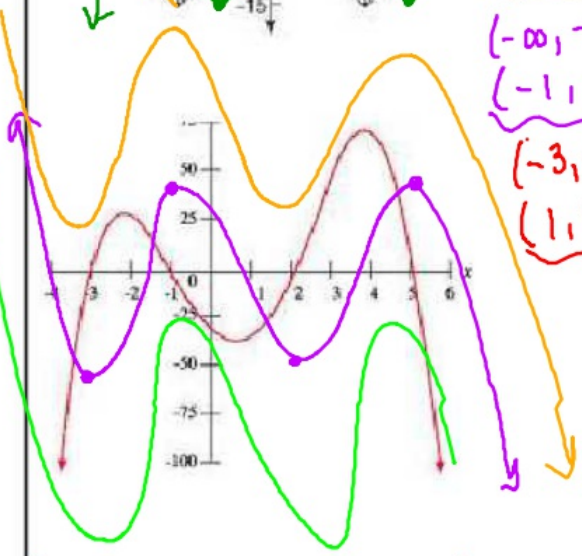
f(x)	f'
H.T. x = -2.5, x = 0, x = 2	x-int
(-∞, -2.5) ∪ (-2.5, 0) inc	above

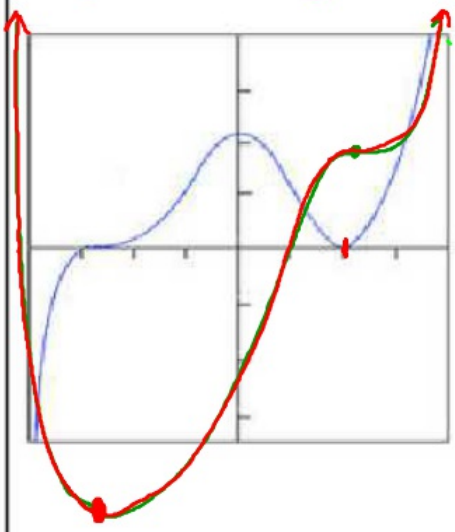
Sketch f(x) on the same coordinate plane as the given graph of $f'(x)$

Derivative graph goes above → below
- Local max

Derivative graph goes below → above
- Local min







$f'(x)$	$f(x)$
x-int: $-3, -1, 1, 3$	$x=-3,1$ max/min (Horizontal Tangents) $x=-1,3$
Local min: $x=-2, 2$	steepest slope
Local max: $x=0$	steepest slope
$(-\infty, -3)$ above	increase (+ slope)
$(-1, 1)$ $(3, \infty)$	
$(-3, -1)$ below	decreasing (neg slope)
$(1, 3)$	