

CALCULUS: Graphical, Numerical, Algebraic by Finney, Demana, Watts and Kennedy
Chapter 3: Derivatives Graphs of the Derivative of a function

What you'll Learn About

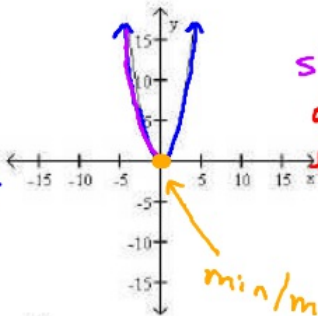
- How to graph the derivative from the original function
- How to graph the function from the derivative

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

1)

$y = x^2$

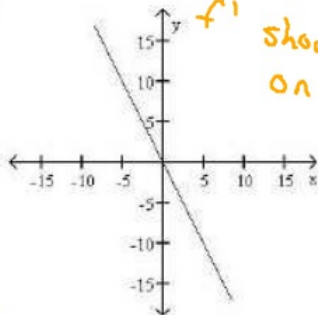
$\frac{dy}{dx}$ linear



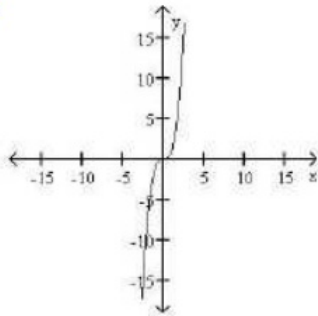
slope $(\frac{dy}{dx}) < 0$ from $(-\infty, 0)$ the graph of $f'(x)$ below x-axis

slope of $f(x) > 0$ the graph of $f'(x)$ is above the x-axis

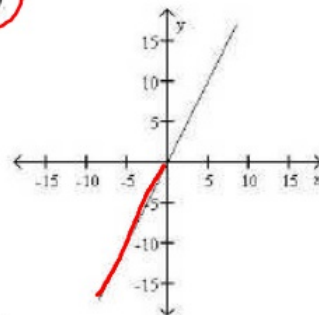
A)



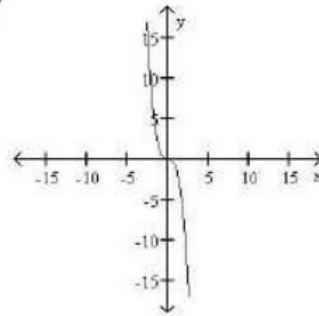
X



B)

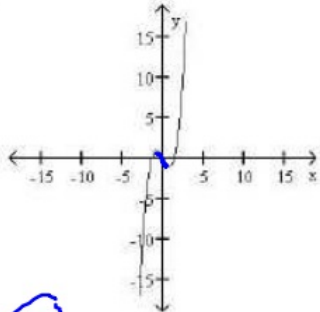


X

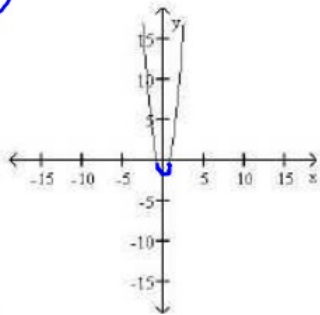


min/max on f f' should be on x-axis

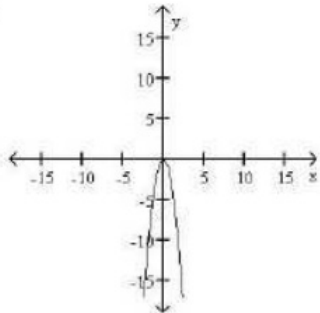
2)



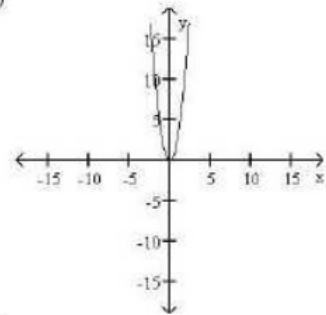
A)



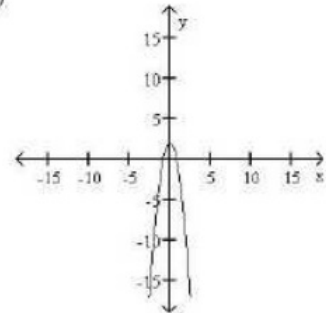
C)

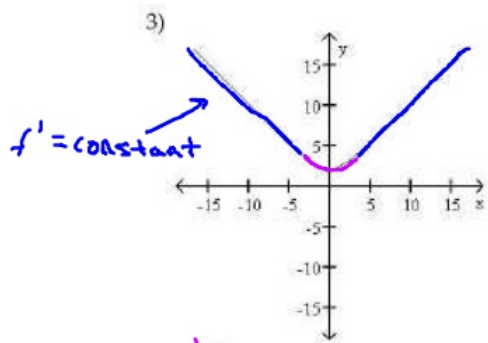


B)

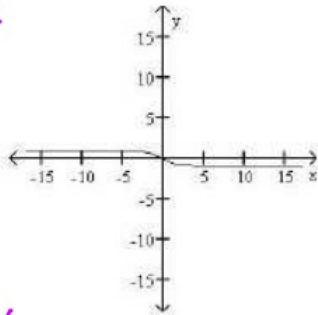


D)

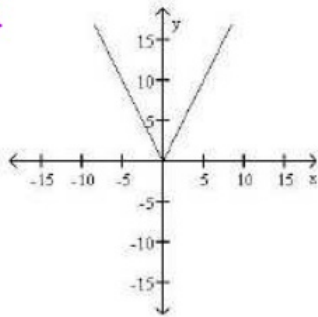




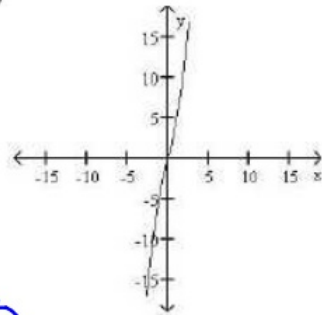
~~X~~



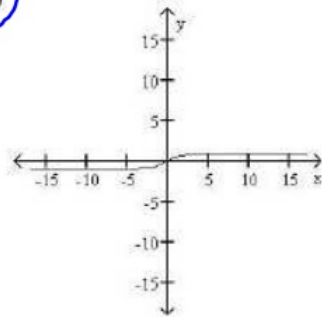
~~X~~



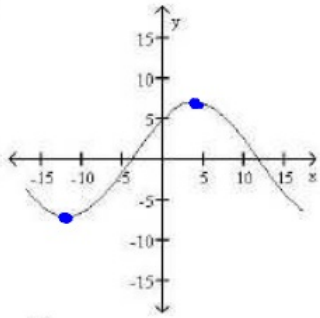
B)



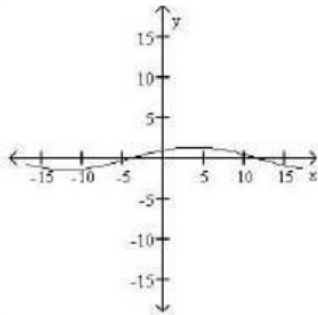
(D)



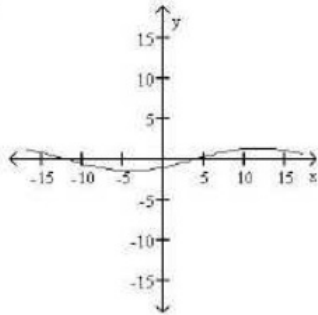
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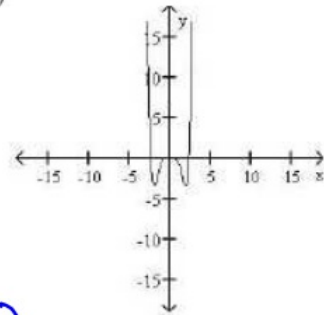
A)



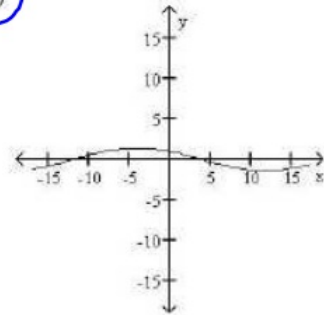
C)



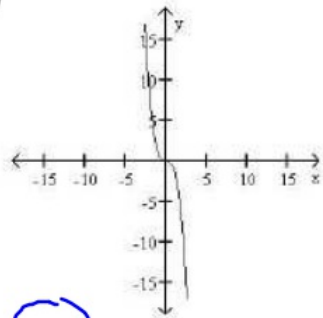
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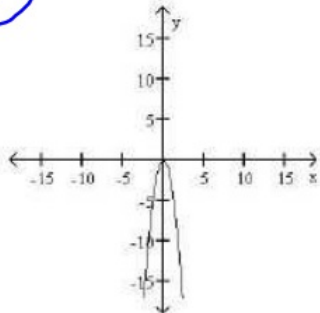
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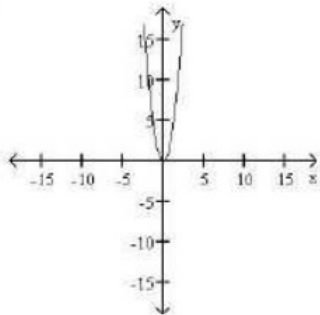
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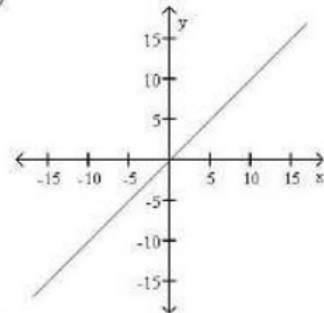
A)



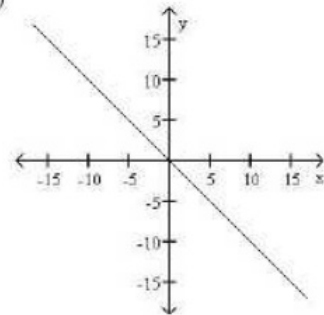
C)



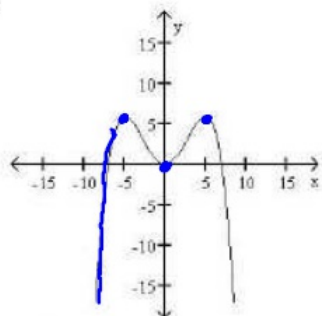
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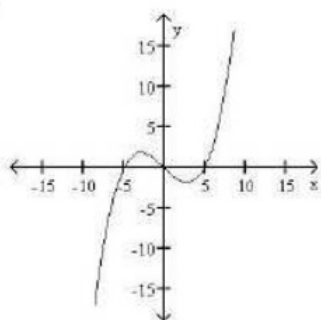
D)



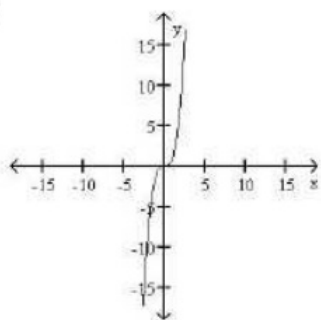
6)



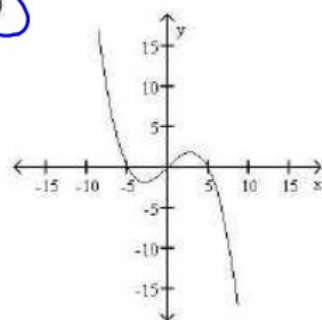
A)



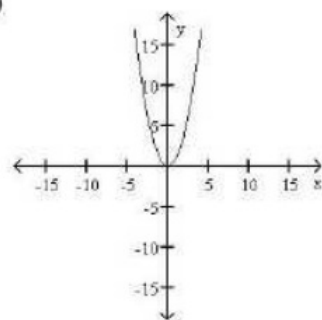
C)



B)



D)

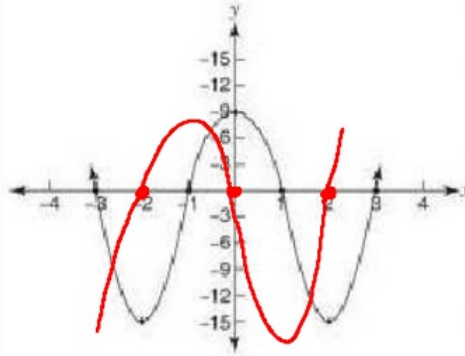


$f'(x)$

$f(x)$

$f'(x)$

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



Max/min on $f(x)$
 $x = -2, 0, 2$

x -intercepts

$(-\infty, -2)$ decreasing

below x -axis

$(-2, 0)$ increasing

above x -axis

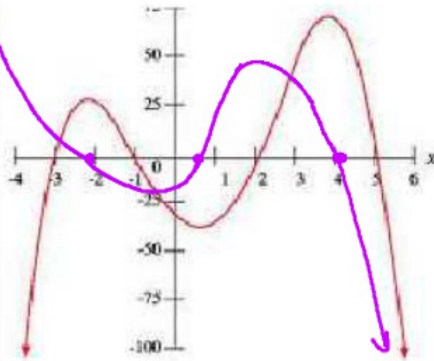
$(0, 2)$ decreasing

below x -axis

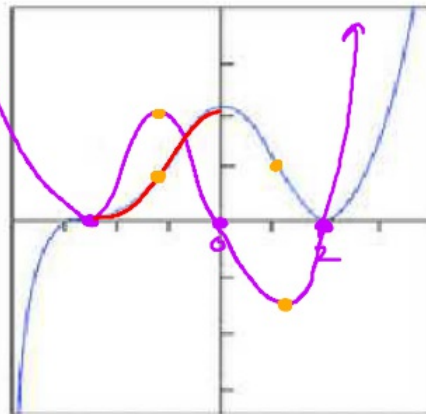
$(2, \infty)$ increasing

above x -axis

$f'(x)$

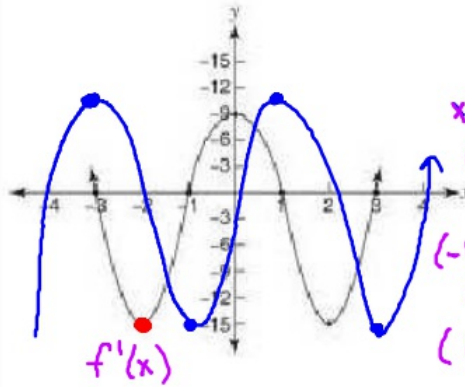


$f'(x)$



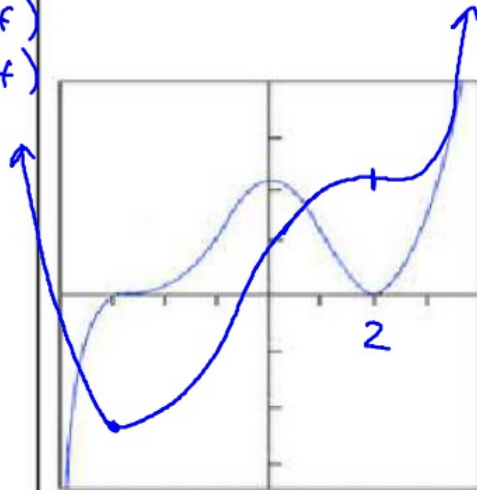
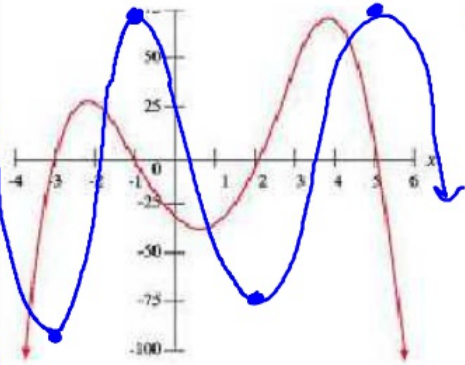
Sketch $f(x)$ on the same coordinate plane as the given graph of $f'(x)$

$f'(x)$
 $x = -2, 0, 2$
 (max/min of f')
 \downarrow
 f inc/dec fastest



$f'(x)$	$f(x)$
$(-\infty, -3)$ above	increasing
$x = -3$ (x-int)	max
$(-3, -1)$ below	decreasing
$x = -1$ (x-int)	min
$(-1, 1)$ above	inc
$x = 1$ (x-int)	max
$(1, 3)$ below	dec
$x = 3$ (x-int)	min
$(3, \infty)$ above	inc

x-int of f'
 max/min on f
 $x = -3$ (min on f)
 $x = -1$ (max on f)
 $x = 2$ (min on f)
 $x = 5$ (max on f)



$(-\infty, -3)$ $f' < 0$	f dec
$x = -3$	min
$(-3, -1)$ $f' > 0$	f inc
$x = 2$ $f' = 0$	max/min/flat
$(2, \infty)$ $f' > 0$	f inc