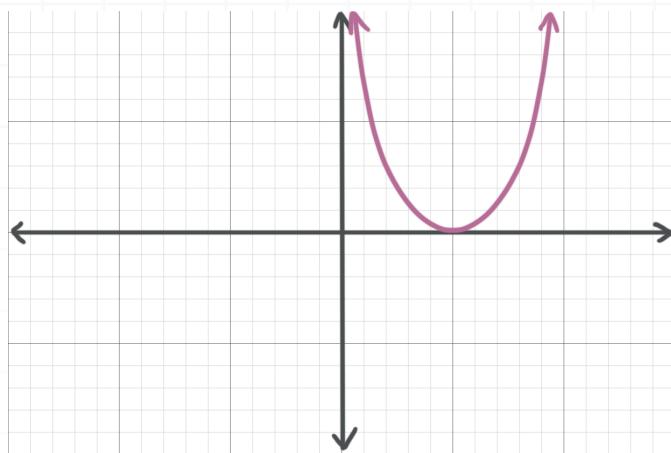
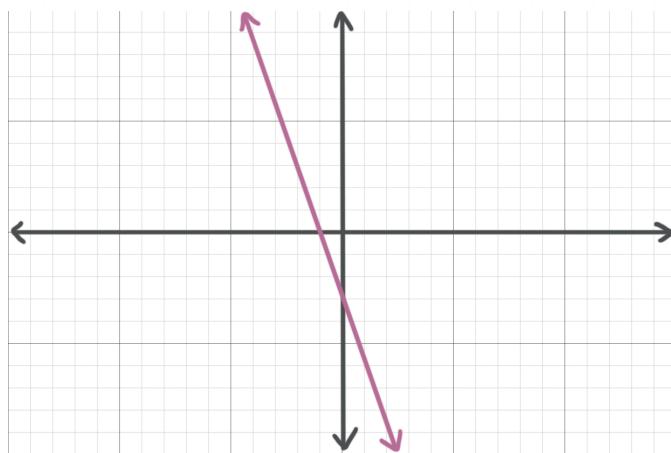
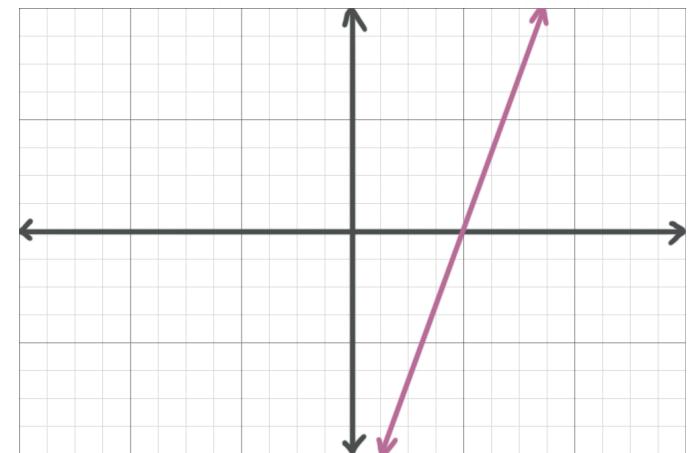


**Topic:** Sketching  $f(x)$  from  $f'(x)$ **Question:** Given the graph of  $f(x)$ , which is a possible graph of  $f'(x)$ ?**Answer choices:**

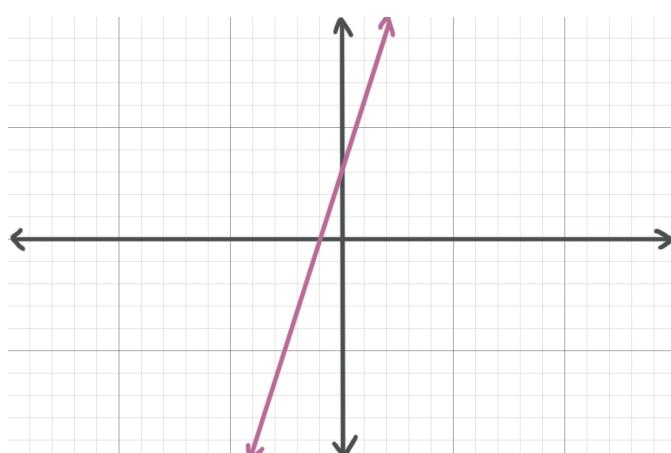
A



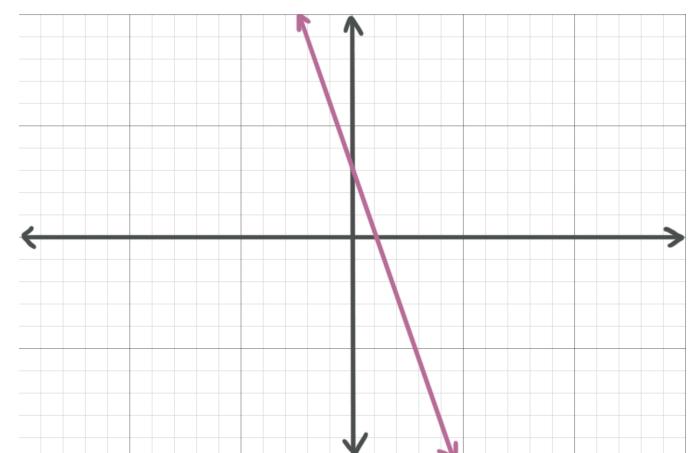
B



C



D



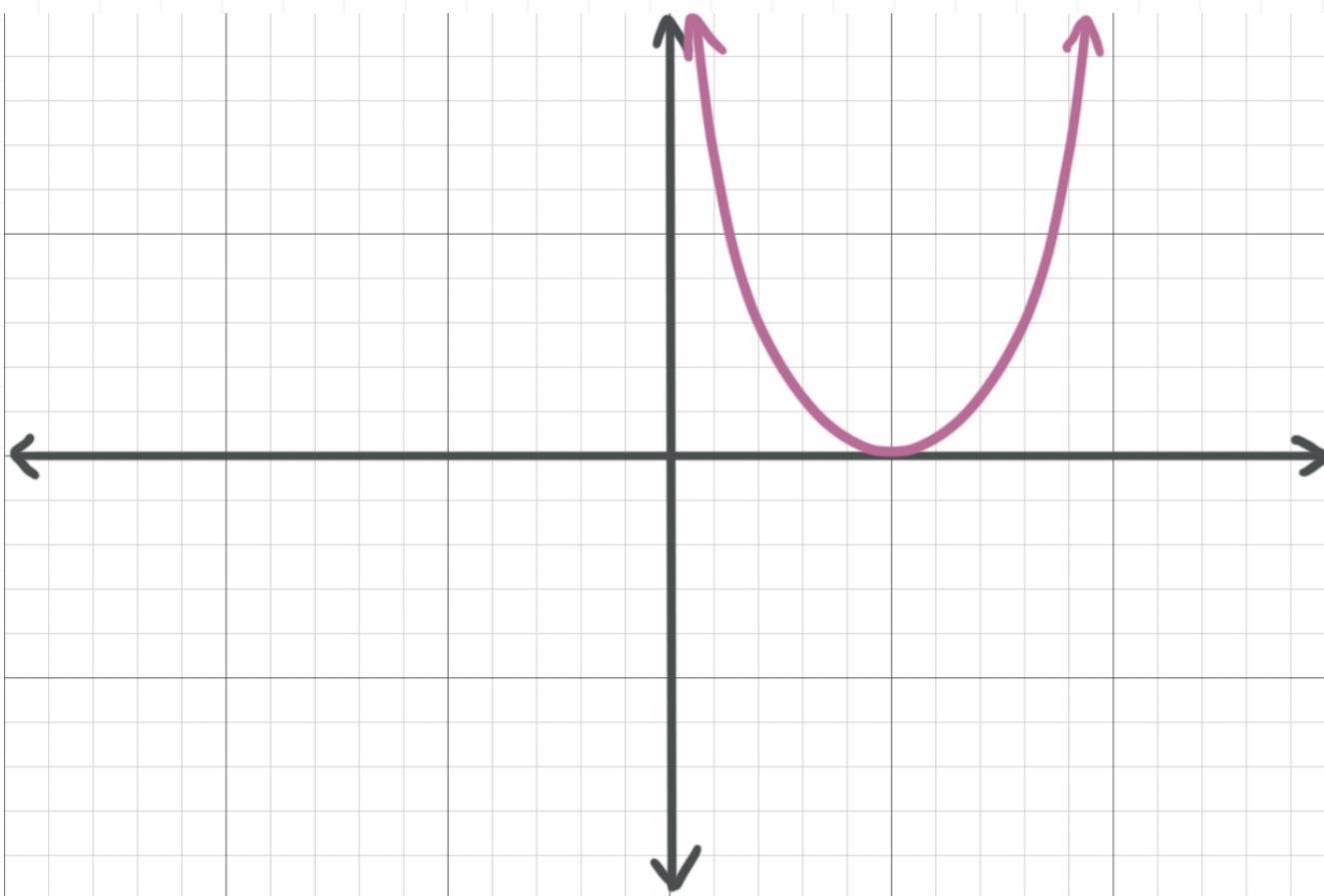
**Solution: B**

To take a sketch of  $f(x)$  and translate it into a sketch of a possible  $f'(x)$ , we'll use the chart that compares the graphs of those two functions.

 $f(x)$  $f'(x)$ **Critical point****0 ( $x$ -intercept)****Increasing****Positive (above the  $x$ -axis)****Decreasing****Negative (below the  $x$ -axis)****Inflection point****Critical point****Concave up****Increasing****Concave down****Decreasing**

If we consider the graph of  $f(x)$  we've been given,

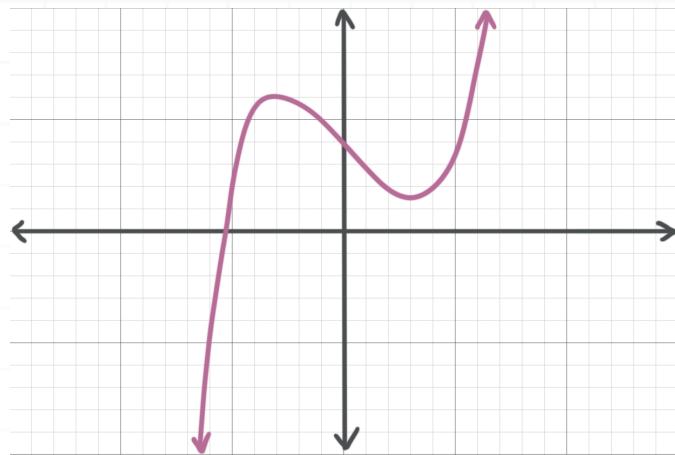
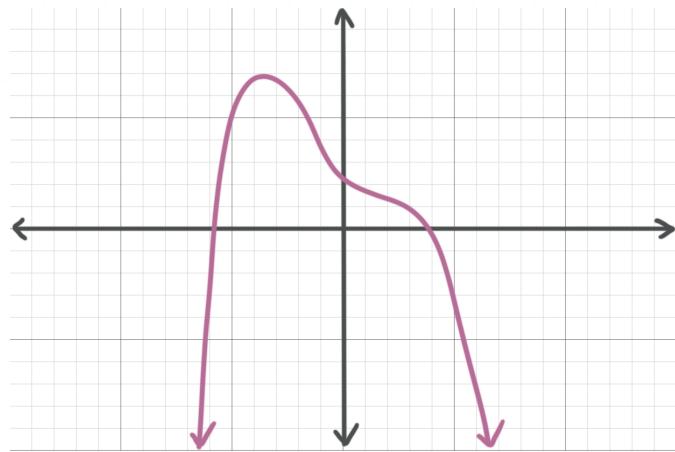




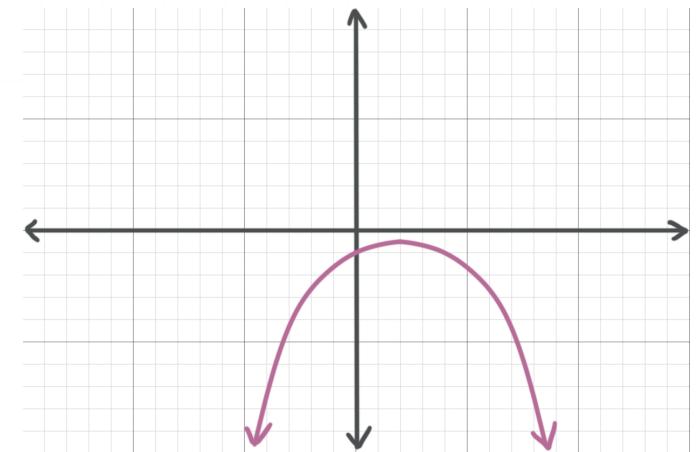
we can see right away that it's concave up everywhere, which means the graph of  $f'(x)$  will be increasing everywhere, which eliminates answer choices A and D.

We can also see that the graph of  $f(x)$  is decreasing to the left of what looks like  $x = 5$ , and then increasing to the right of that point. If that's the case, then the graph of  $f'(x)$  should be negative (below the  $x$ -axis) to the left of  $x = 5$  and positive (above the  $x$ -axis) to the right of  $x = 5$ .

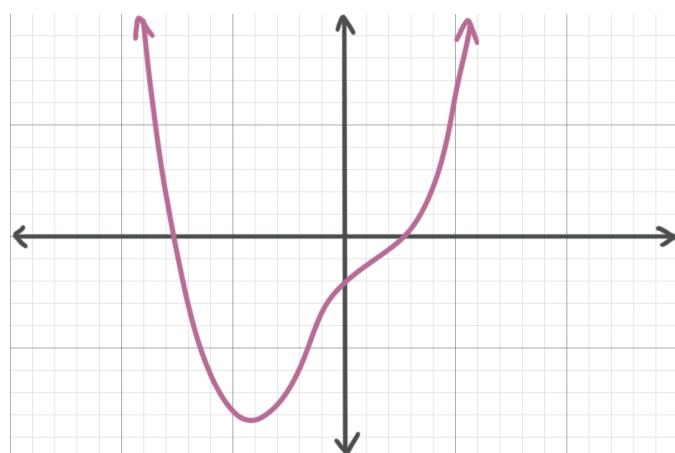
That matches answer choice B, and not answer choice C.

**Topic:** Sketching  $f(x)$  from  $f'(x)$ **Question:** Given the graph of  $f'(x)$ , which is a possible graph of  $f(x)$ ?**Answer choices:**

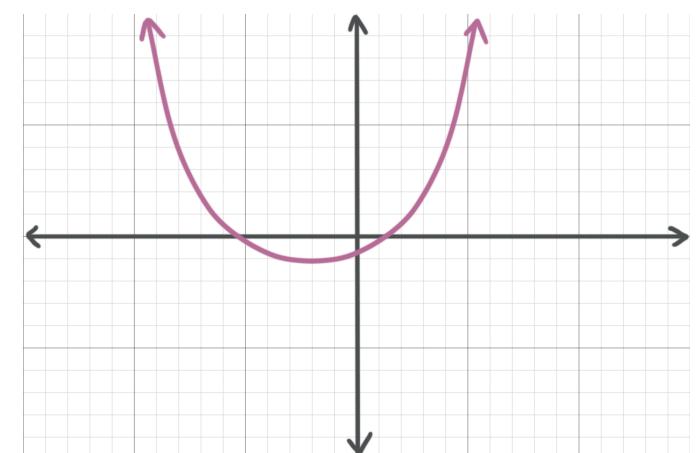
A



B



C



D

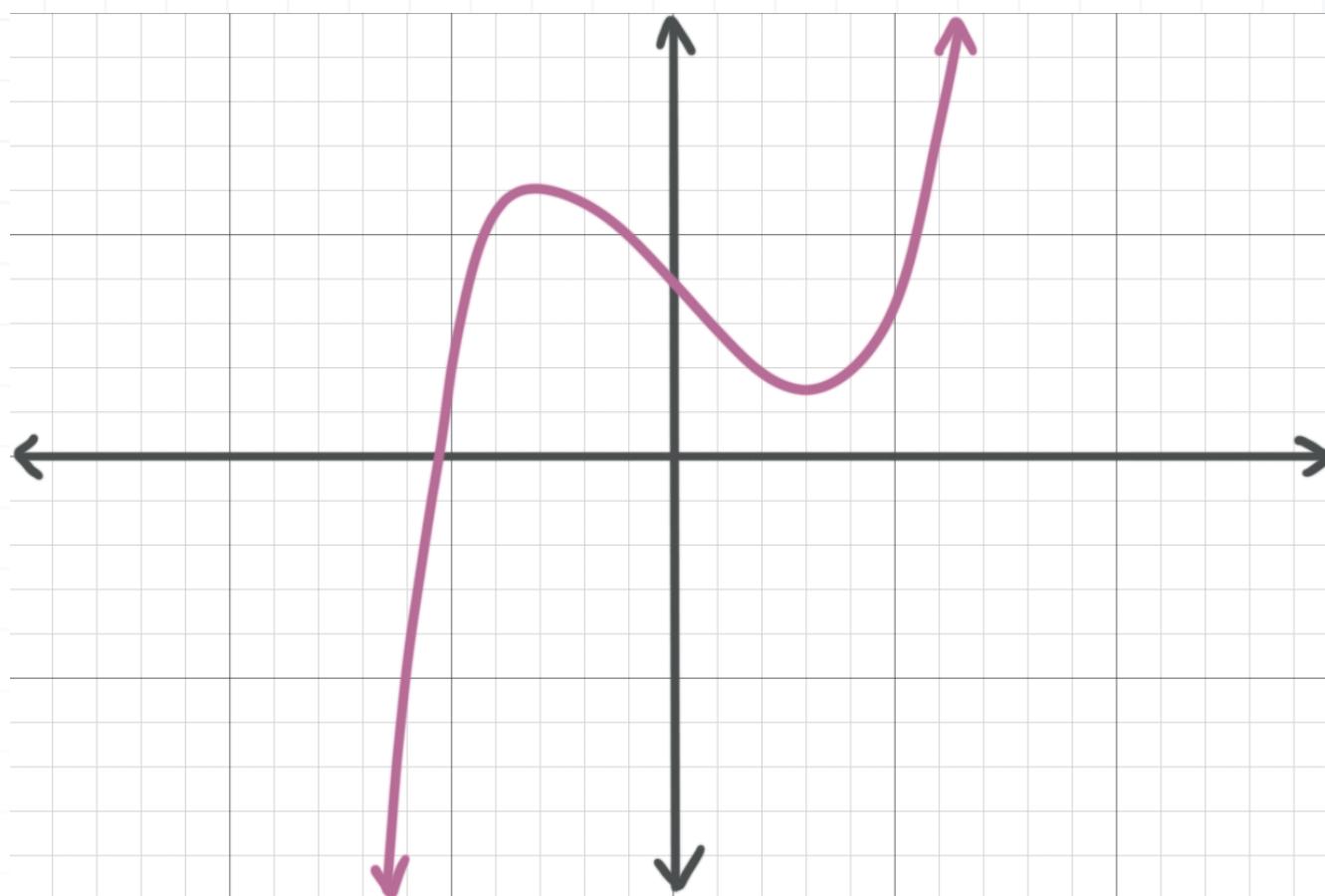
**Solution: C**

To take a sketch of  $f'(x)$  and translate it into a sketch of a possible  $f(x)$ , we'll use the chart that compares the graphs of those two functions.

 $f(x)$  $f'(x)$ **Critical point****0 ( $x$ -intercept)****Increasing****Positive (above the  $x$ -axis)****Decreasing****Negative (below the  $x$ -axis)****Inflection point****Critical point****Concave up****Increasing****Concave down****Decreasing**

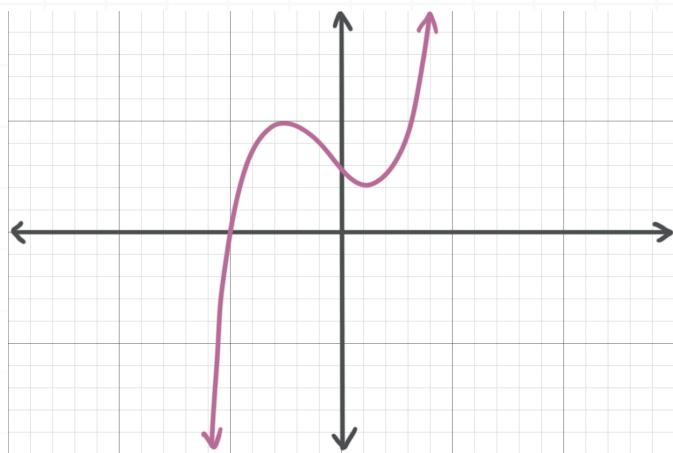
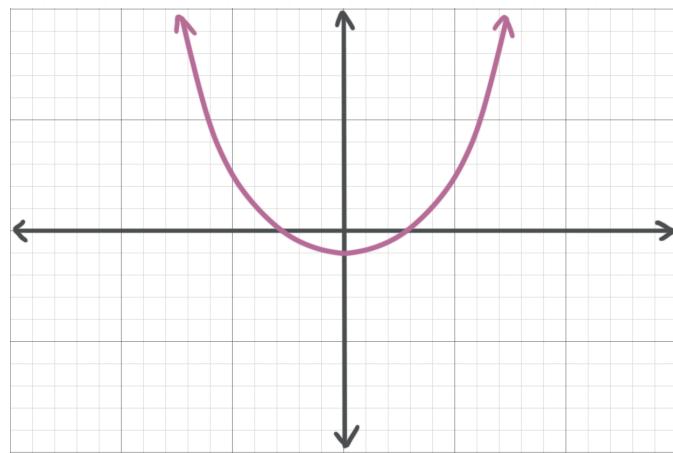
If we consider the graph of  $f'(x)$  we've been given,



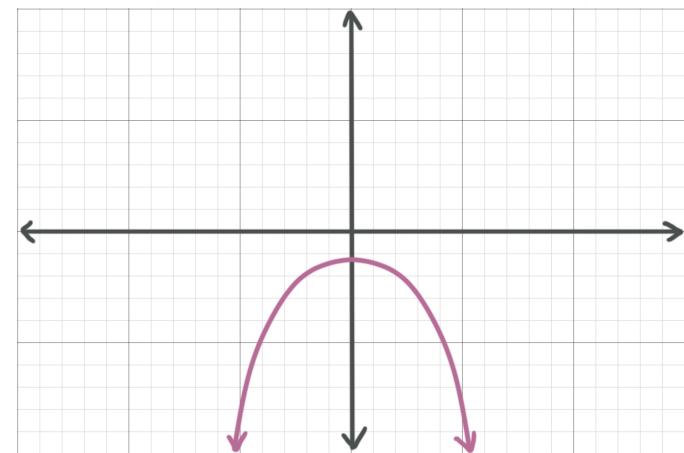


we can see right away that, as we move from left to right, it's increasing, then decreasing, then increasing again. Which means that the graph of  $f(x)$ , as we move from left to right, must be concave up, then concave down, then concave up again.

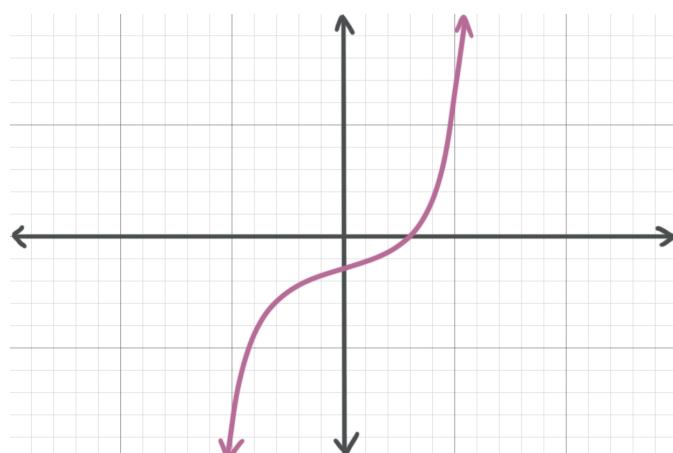
The only graph matching that concavity pattern is the graph in answer choice C.

**Topic:** Sketching  $f(x)$  from  $f'(x)$ **Question:** Given the graph of  $f(x)$ , which is a possible graph of  $f'(x)$ ?**Answer choices:**

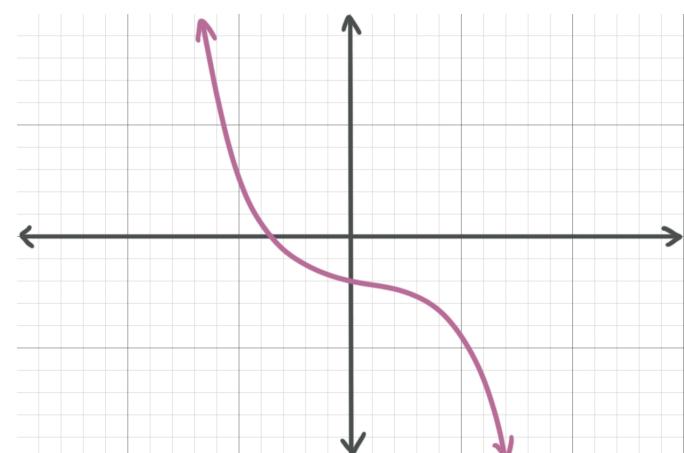
A



B



C



D

## Solution: A

To take a sketch of  $f(x)$  and translate it into a sketch of a possible  $f'(x)$ , we'll use the chart that compares the graphs of those two functions.

$f(x)$

$f'(x)$

**Critical point**

**0 ( $x$ -intercept)**

**Increasing**

**Positive (above the  $x$ -axis)**

**Decreasing**

**Negative (below the  $x$ -axis)**

**Inflection point**

**Critical point**

**Concave up**

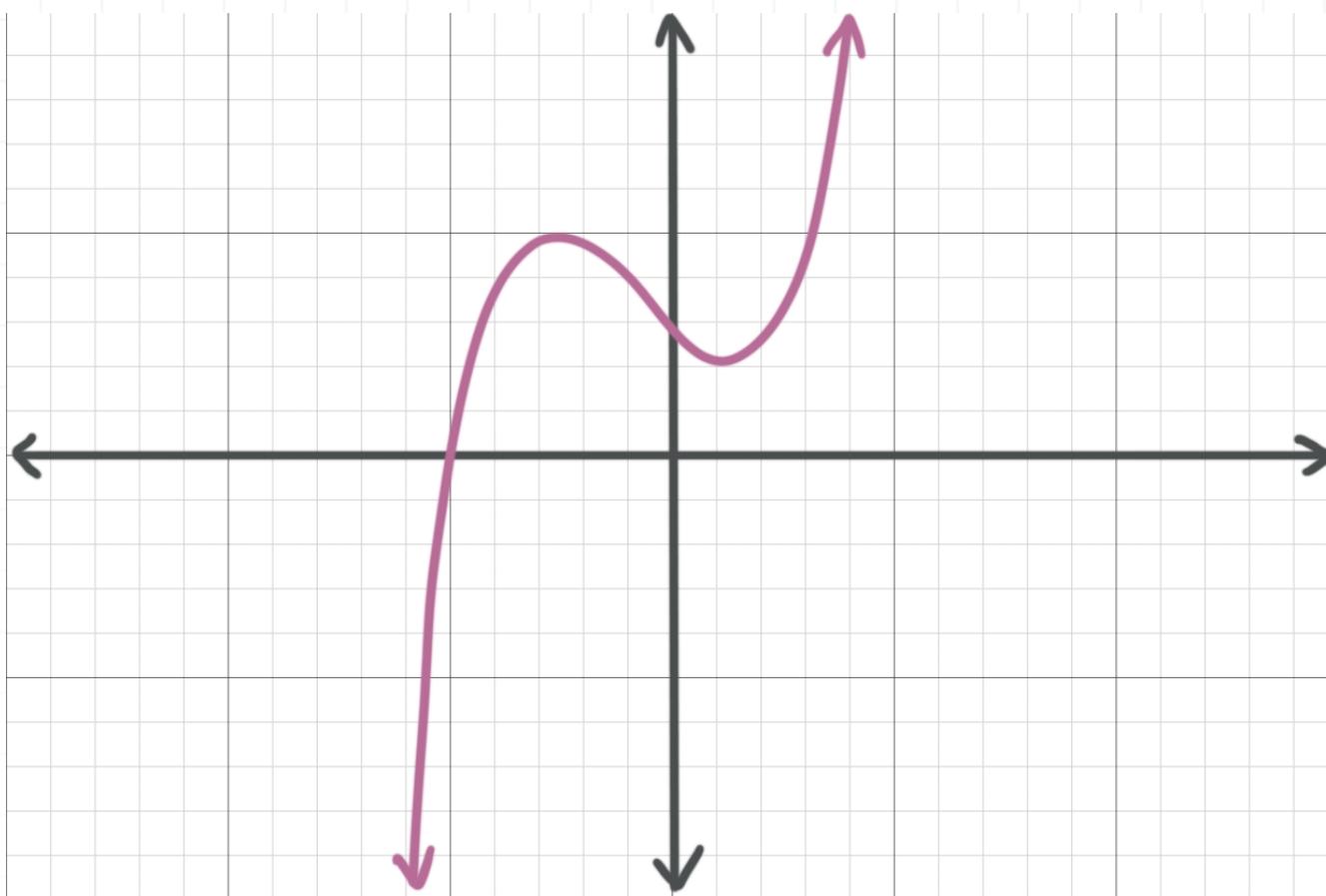
**Increasing**

**Concave down**

**Decreasing**

If we consider the graph of  $f(x)$  we've been given,





we can see right away that, as we move from left to right, it's concave down and then concave up, which means that, as we move from left to right, the graph of  $f'(x)$  will be decreasing and then increasing.

The only graph matching that direction pattern is the graph in answer choice A.