

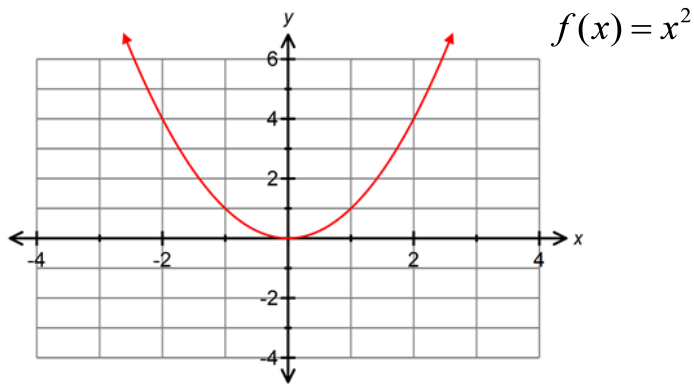
Lesson 4.9 Connection between the derivative function and the original function

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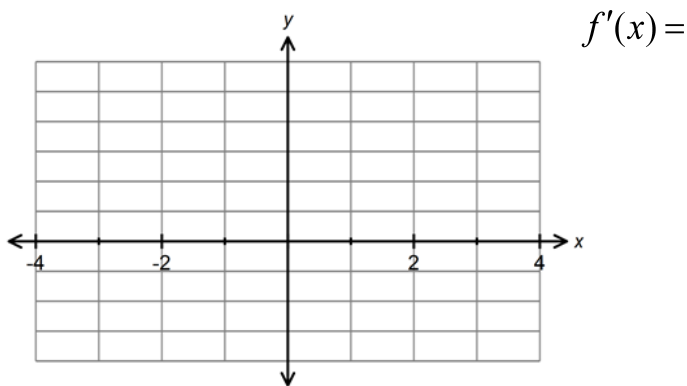
Connection between the Function and its Derivative (Graphically)



Example: Sketch a possible graph of $y = f'(x)$ given the graph of $y = f(x)$



Explore the slope of the tangent at various points.



$$f'(-2) =$$

$$f'(-1) =$$

$$f'(0) =$$

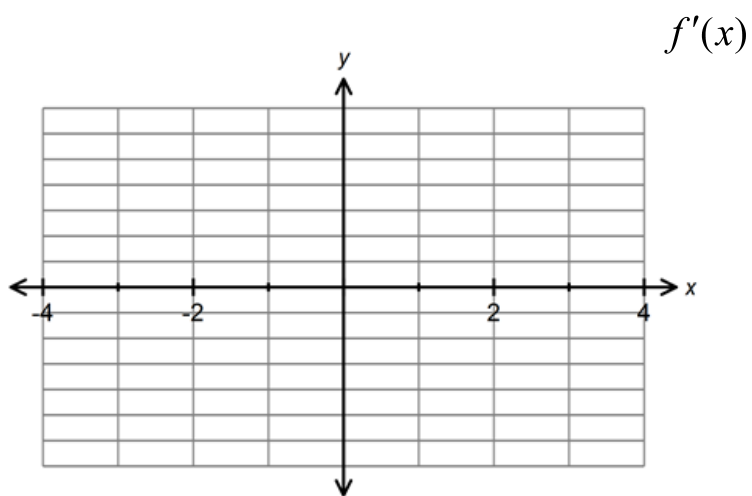
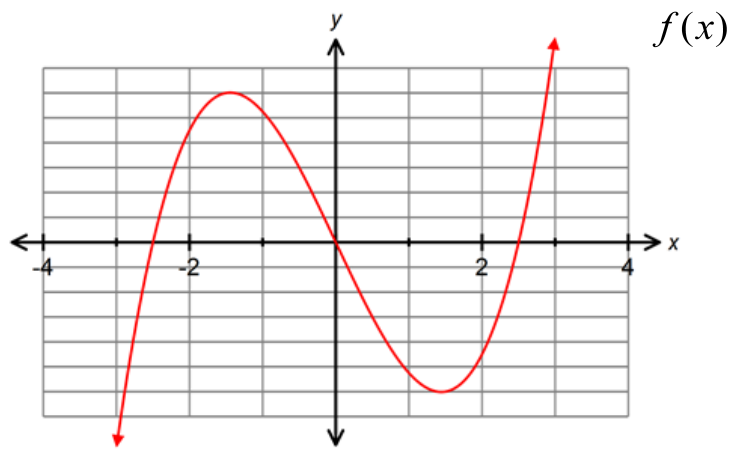
$$f'(1) =$$

Observe:

1. the x-coordinates of the local maximum or minimum of $f(x)$ correspond the x-intercepts on the graph of $f'(x)$
2. When the graph of $f(x)$ is increasing the graph of $f'(x)$ lies above the x-axis
3. When the graph of $f(x)$ is decreasing the graph of $f'(x)$ lies below the x-axis

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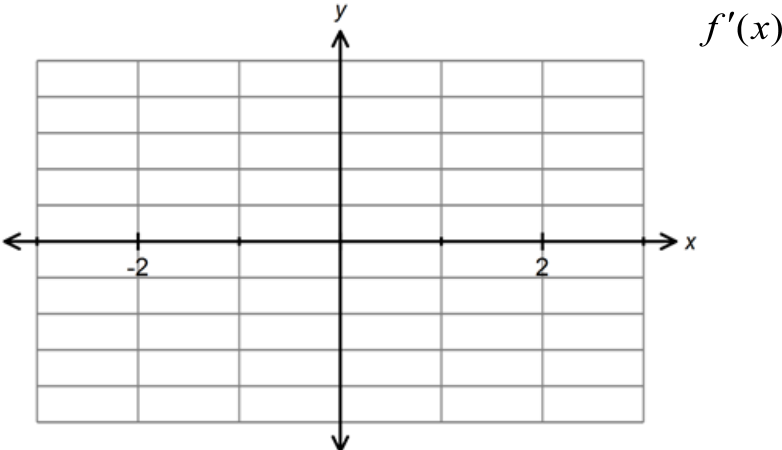
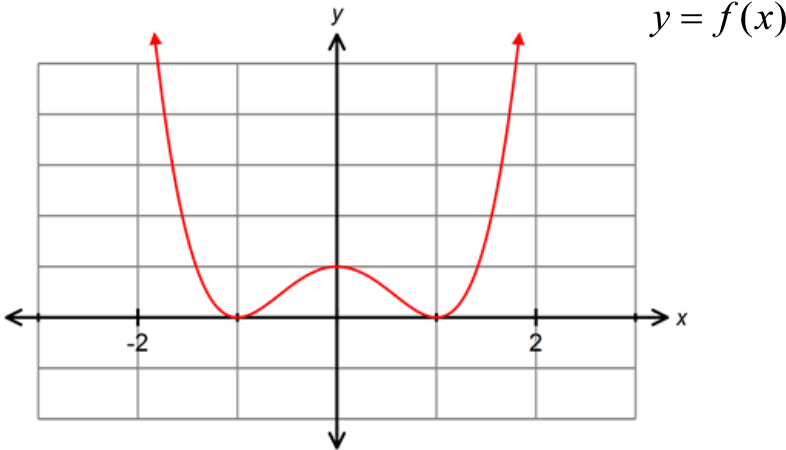
Example 2:



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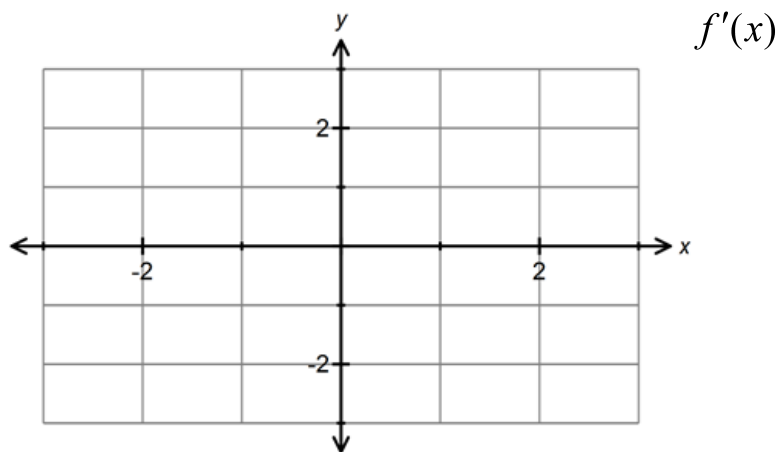
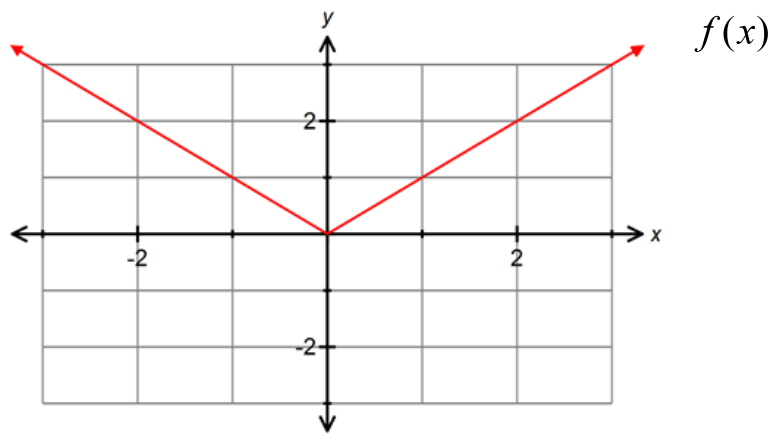
Example 3:



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Example 4:



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