

Matching the graph of a function to the graph of its derivative

Practice Quiz, 5 questions

5/5 points (100%)



Congratulations! You passed!

Next Item



1 / 1
point

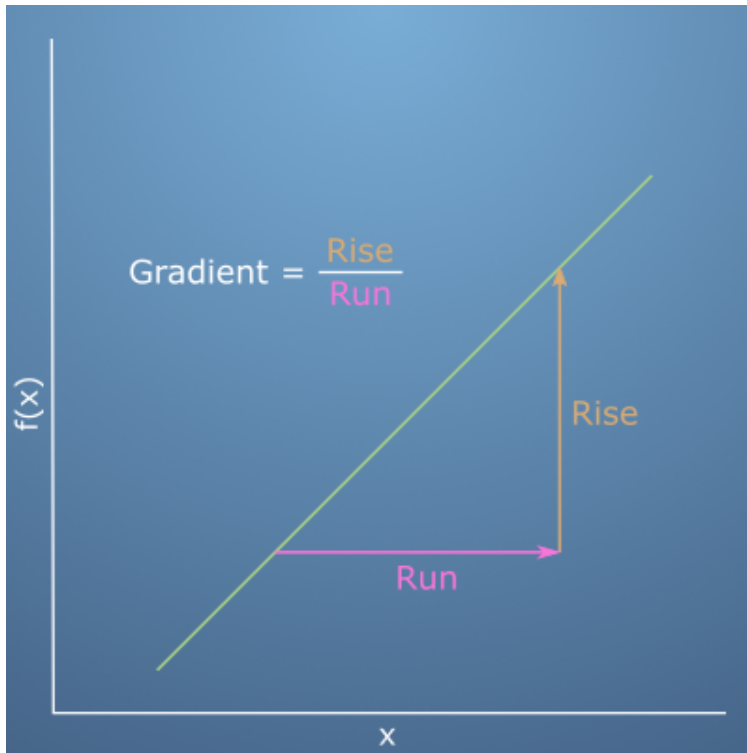
1.

In this quiz you will practice estimating the derivative of a function by choosing the most suitable graphs.

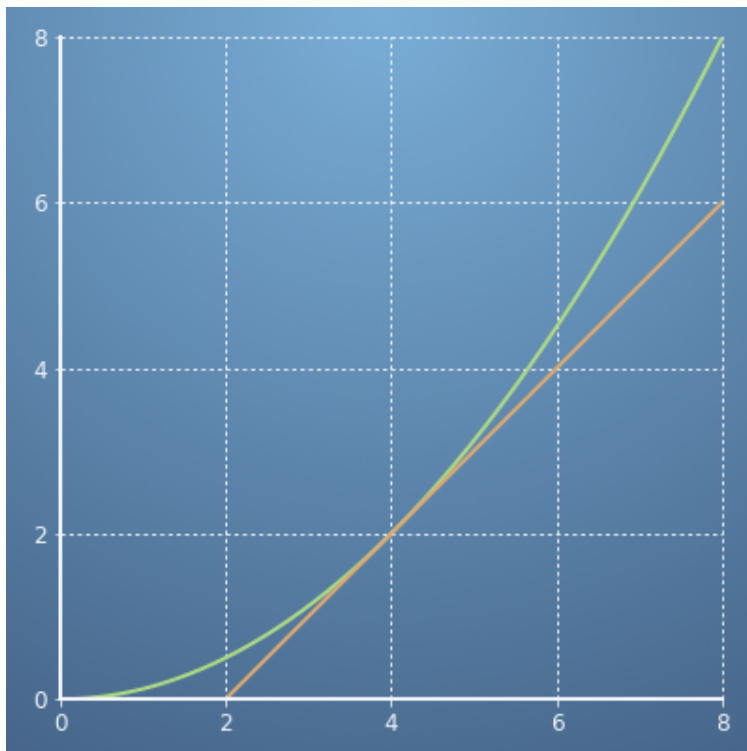
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Practice Question: We can calculate the gradient of a straight line by looking at how much the function $f(x)$ changes, divided by the amount the variable x changes. This is sometimes called "rise over run", as illustrated in the following image:



Use this information to estimate the gradient of the tangent to the non-linear, green function at the point $(4, 2)$ based on the image below. (NB. the tangent line at the point $(4, 2)$ is drawn on in orange to help you do this calculation.)



The gradient is -1.

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The gradient is 0.

The gradient is 1.

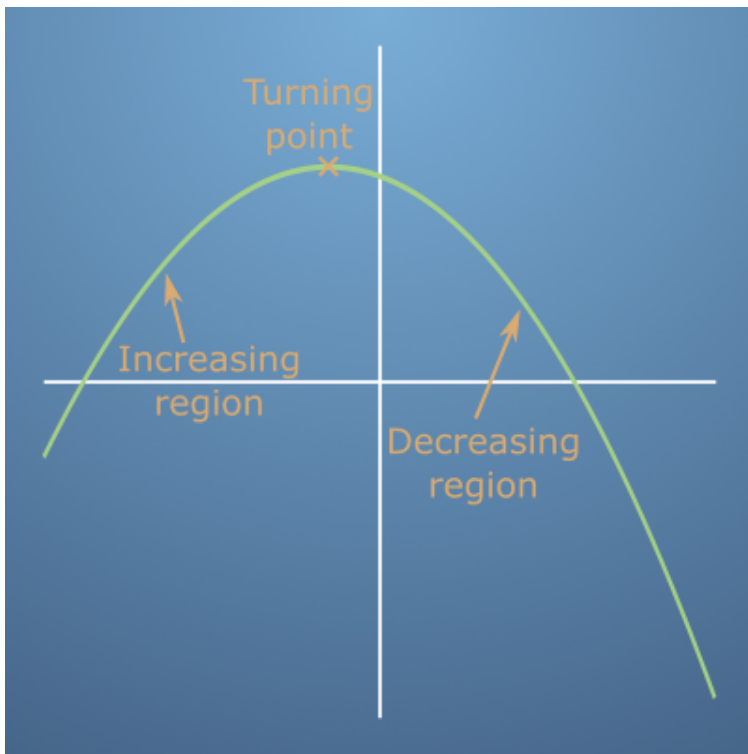
CorrectChange in y divided by the change in x gives the gradient of a straight line (the tangent).

The gradient is 2.

1 / 1
point

2.

It's possible to have a reasonable guess at what the derivative of a function will look like by considering regions of the function with different gradients. Let's look at the following image as an example:



We can see that there are three types of behaviour we might see in the gradient of a smooth function. On the left there is a region where the function is increasing, and therefore has a positive gradient, which is the same as saying it has a positive derivative.

On the right there is a region where the function is decreasing, so the gradient and derivative would be negative.

In between there is a turning point, where the gradient is exactly 0 at a specific value of x . Here the derivative will pass through 0 as it moves from positive on the left to negative on the right.

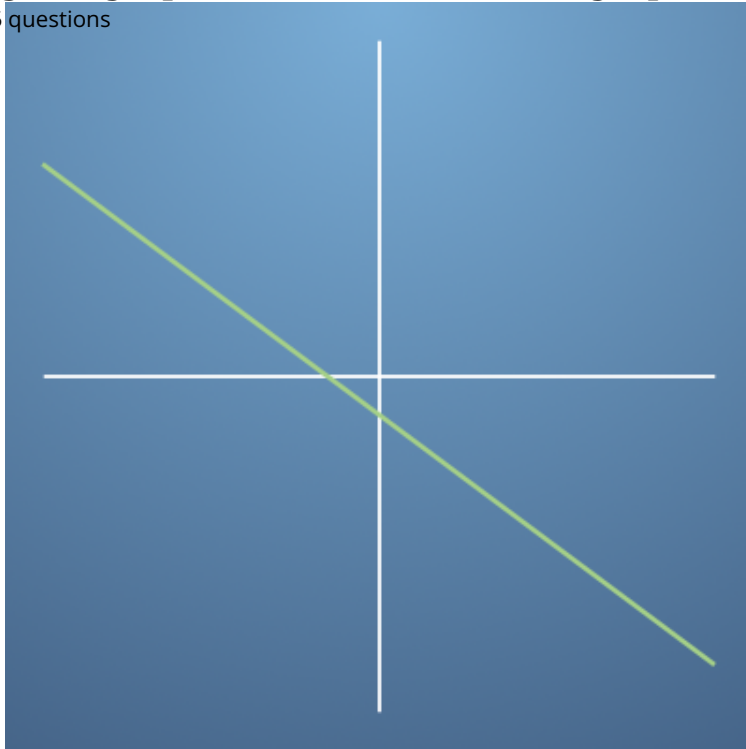
Using this information, which plot could show the derivative of the above function? Assume the x -axis is over the same range.



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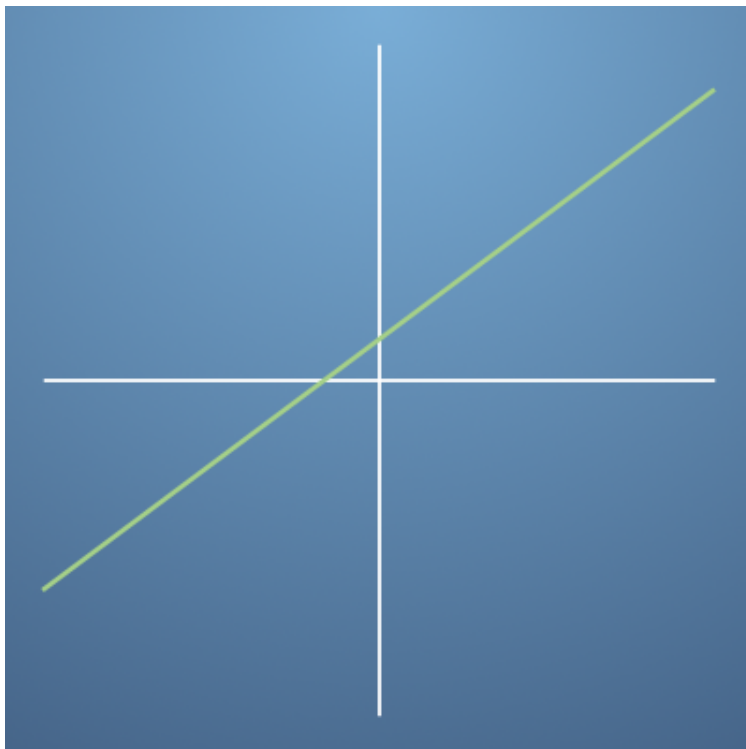
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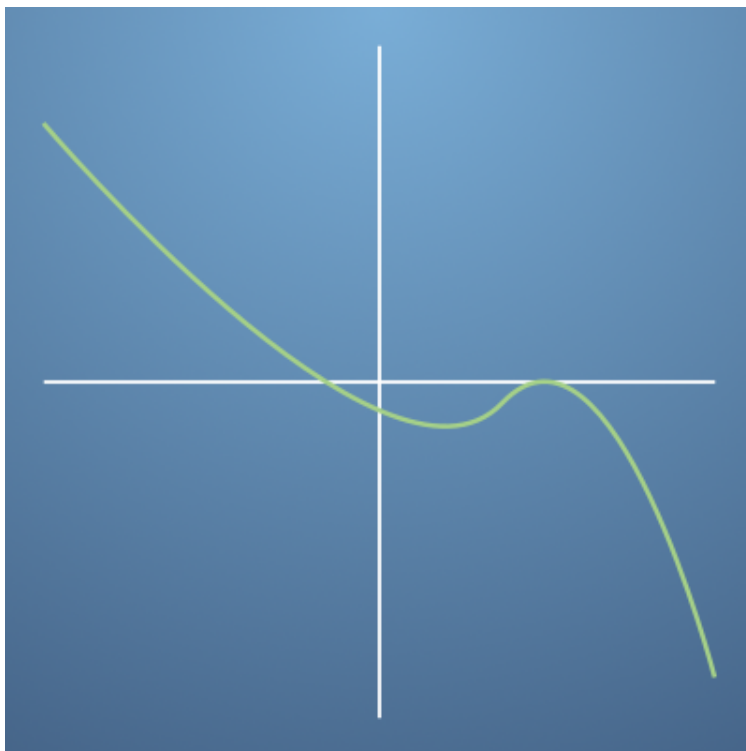
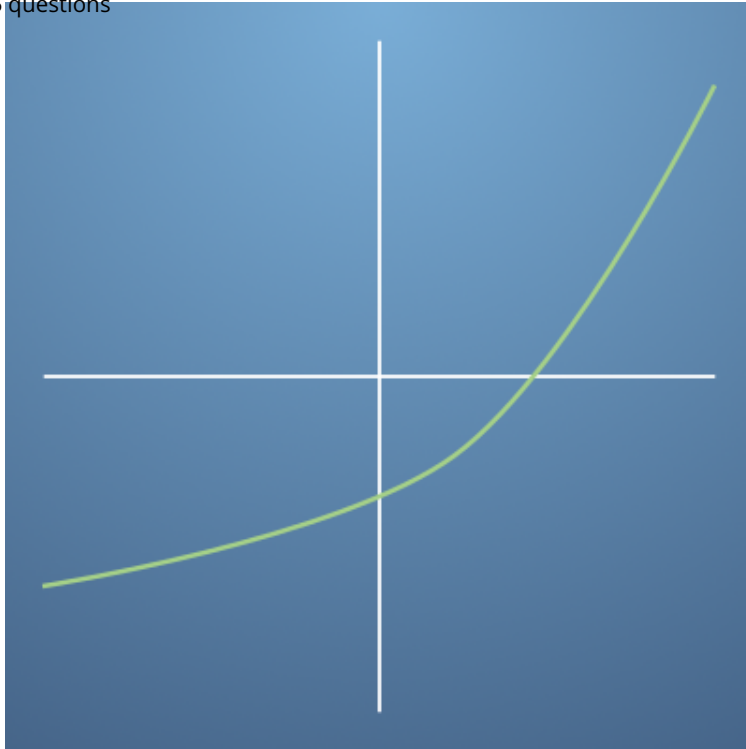
Correct

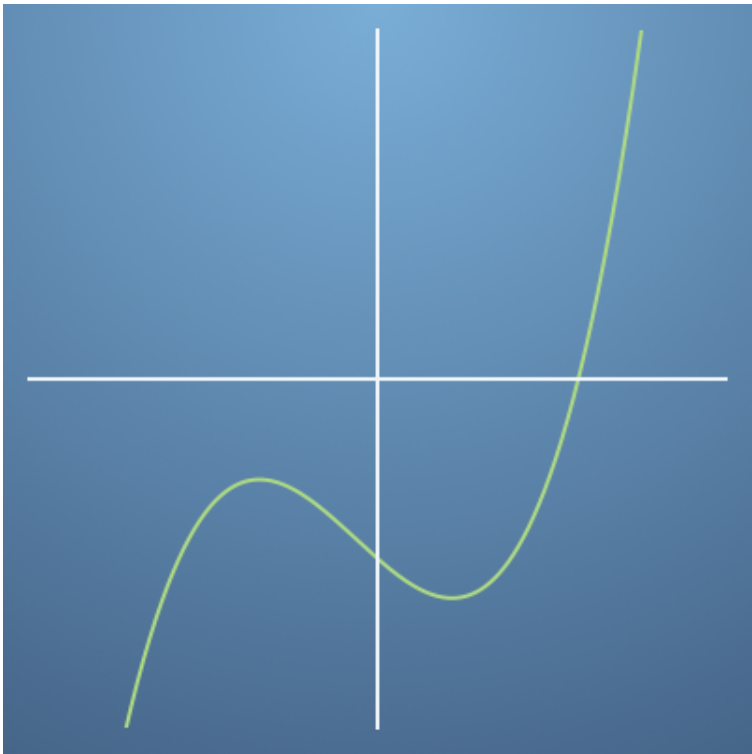
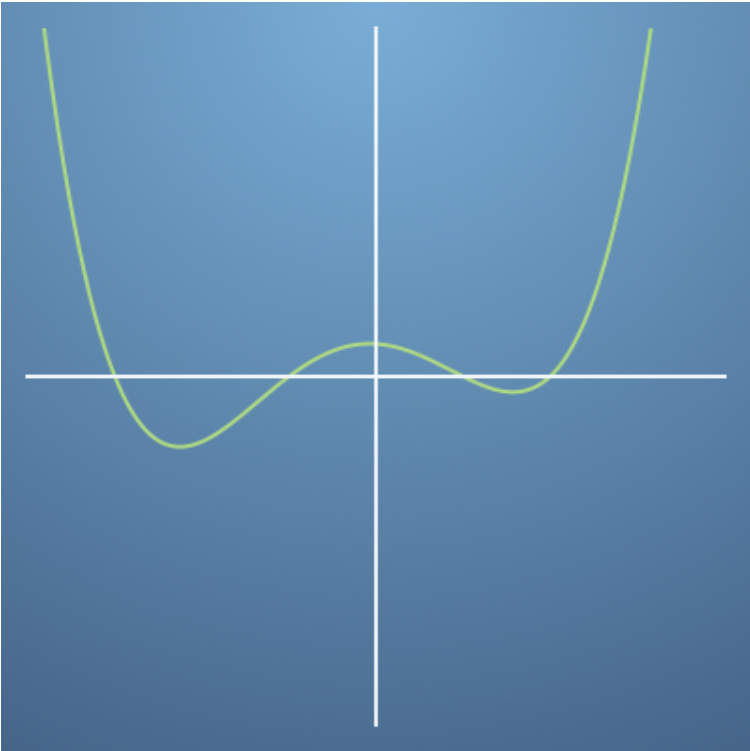
The derivative starts positive in the "increasing region" and becomes negative in the "decreasing region", passing through zero at the "turning point"



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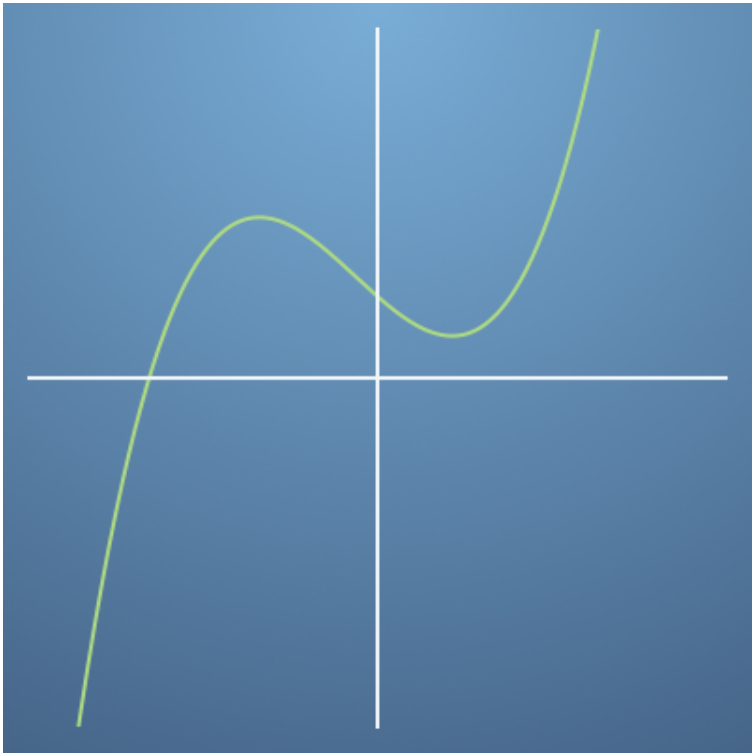
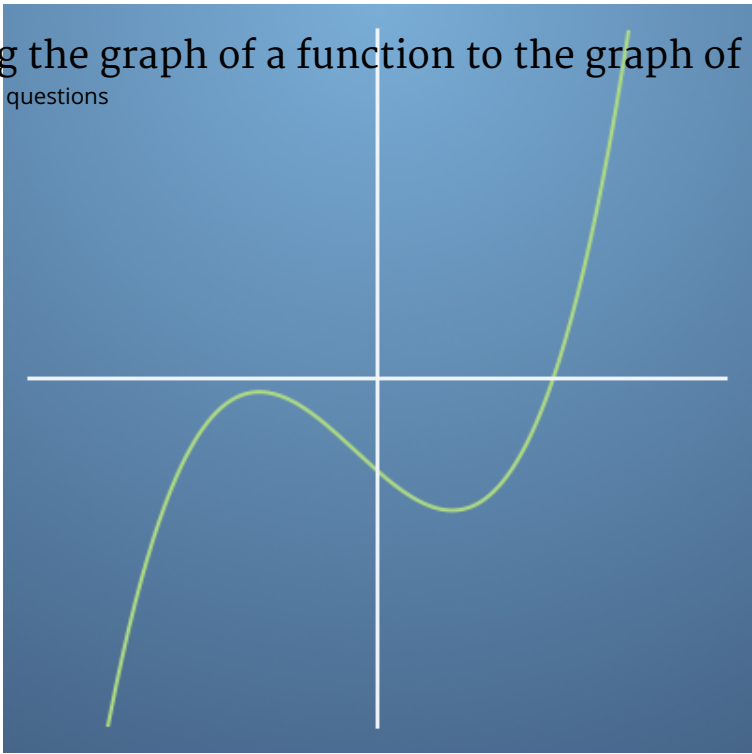
5/5 points (100%)1 / 1
point



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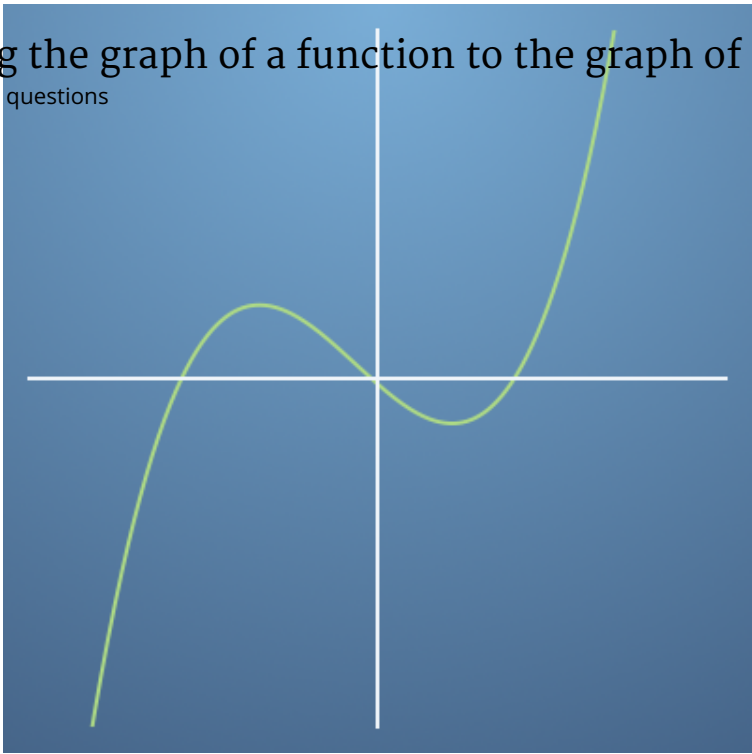
5/5 points (100%)



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5/5 points (100%)



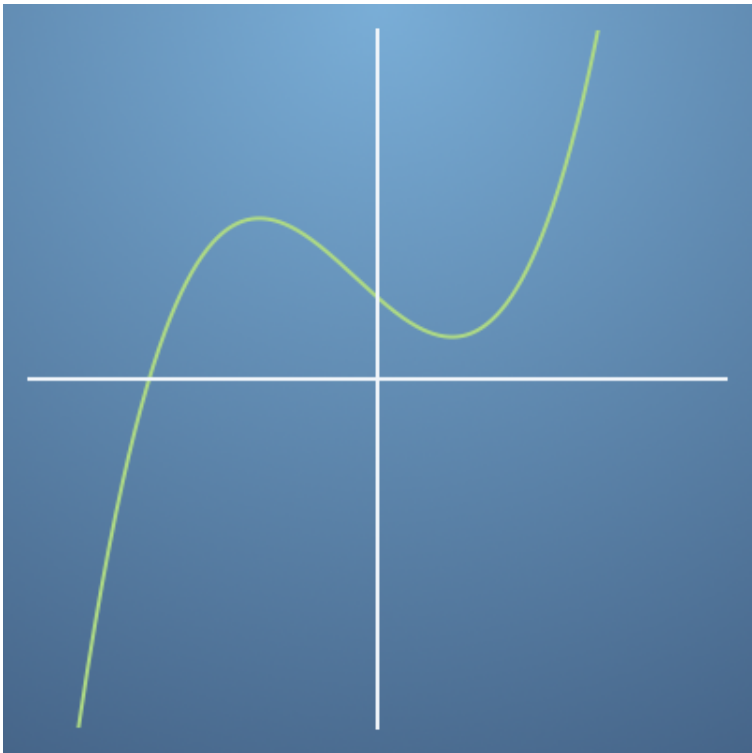
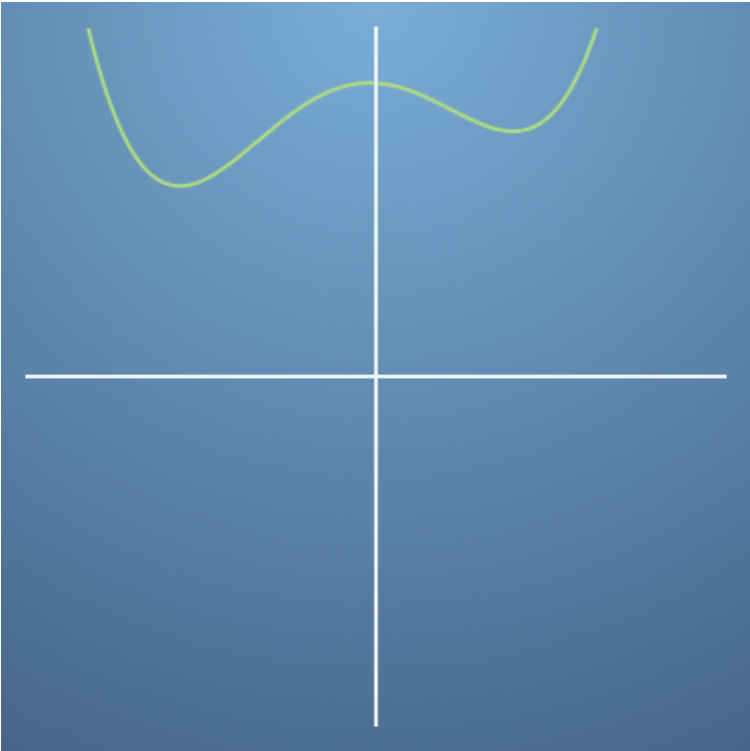
Correct

This figure best describes how the function changes with x .



1 / 1
point

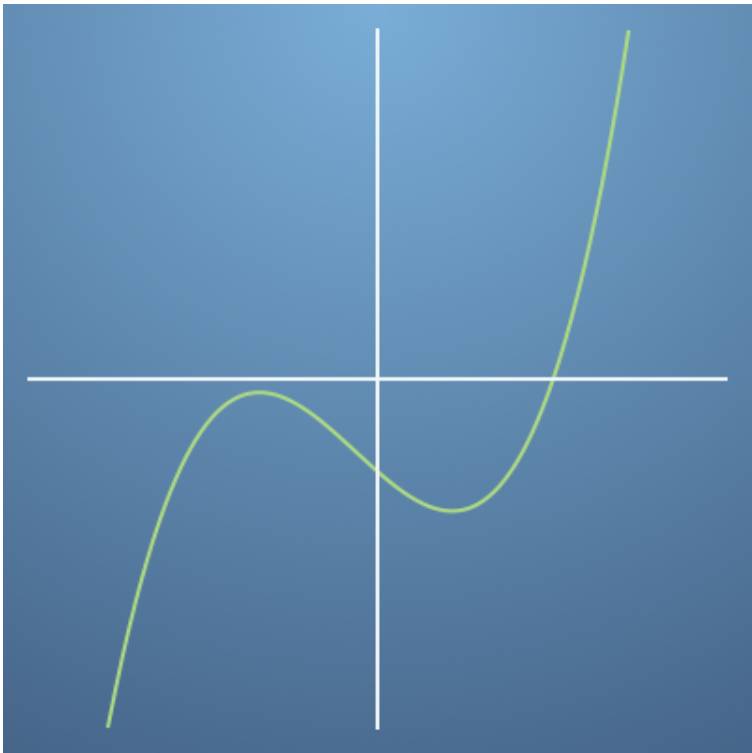
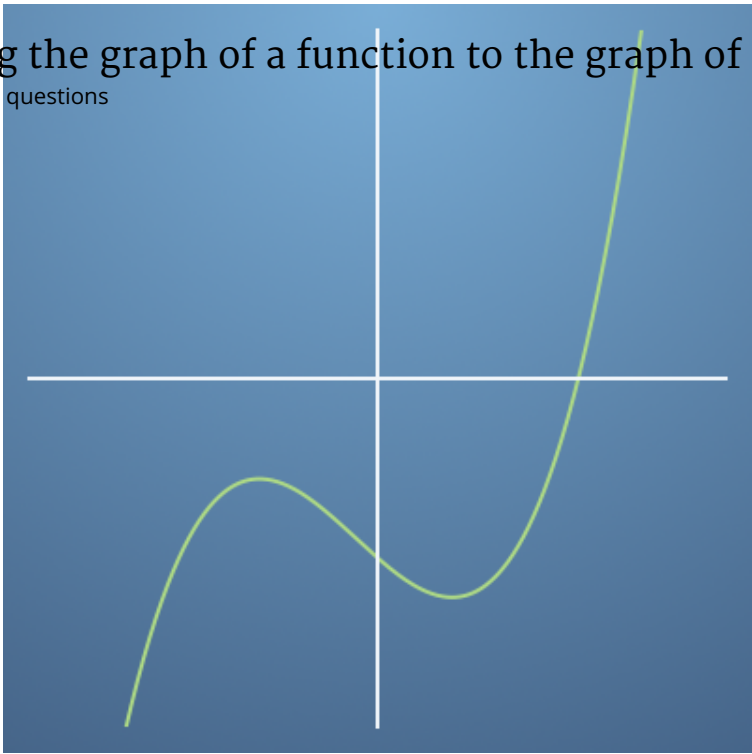
4.



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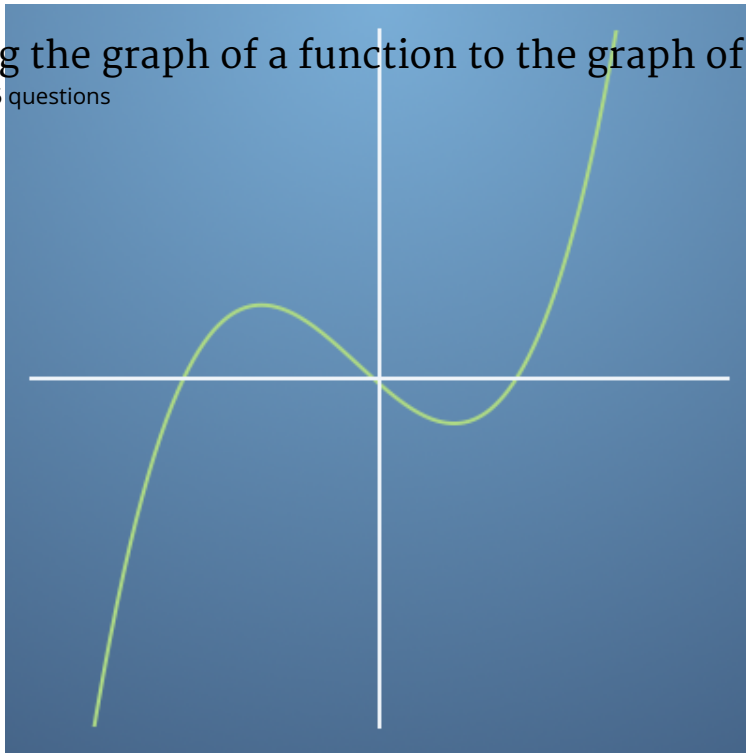
5/5 points (100%)



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Correct

Shifting a function up or down does not change the gradient at all.



1 / 1
point

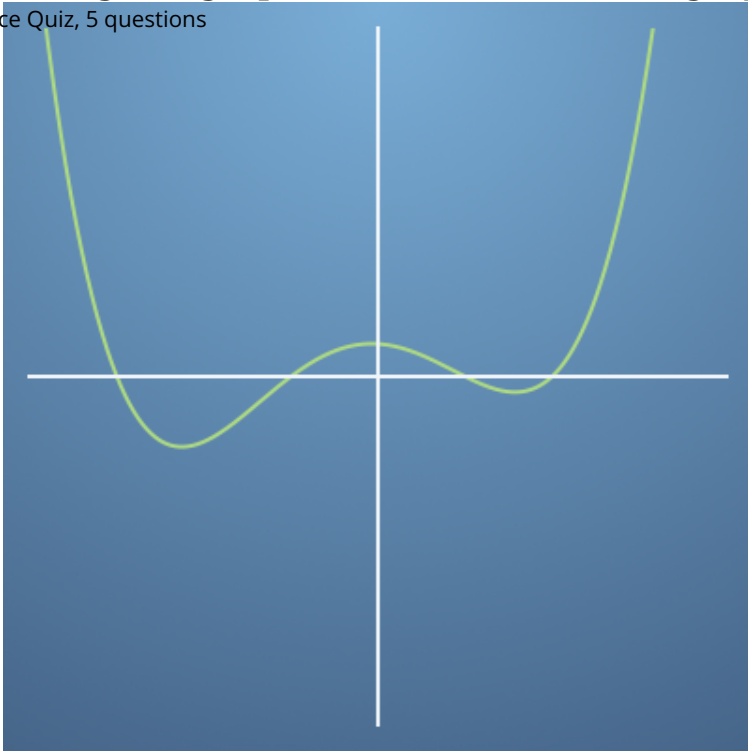
5.

Now for the reverse problem... Look at the figure below.

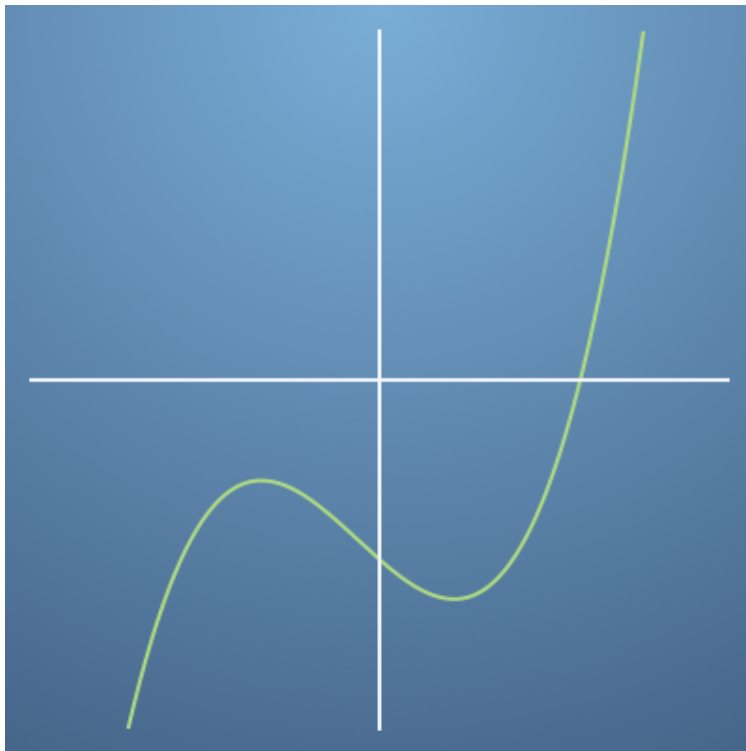
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Which of the following diagram(s) could the above plot be the **derivative** of? Choose all correct answers.
(Hint: How many times is the curve above equal to zero (i.e. crosses the horizontal axis))?



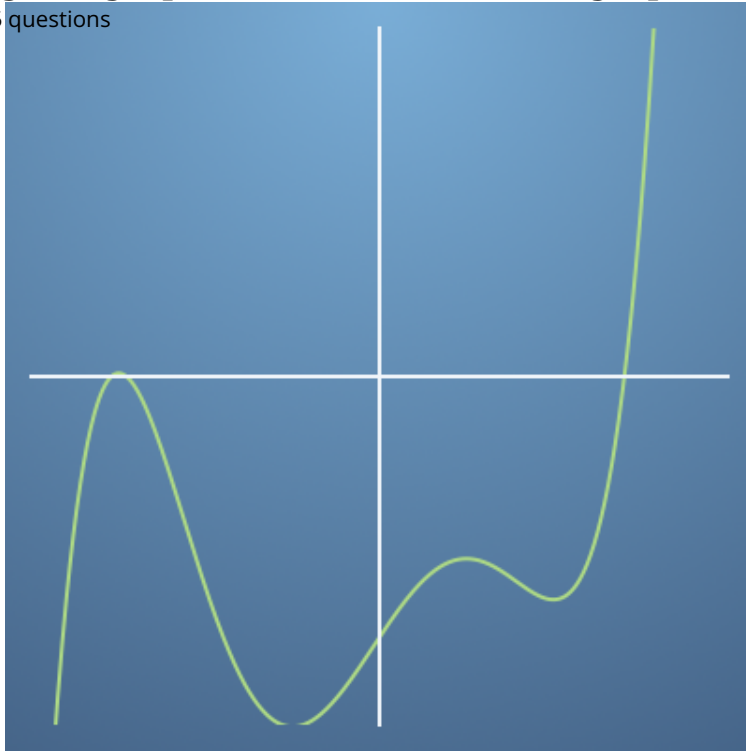
Un-selected is correct



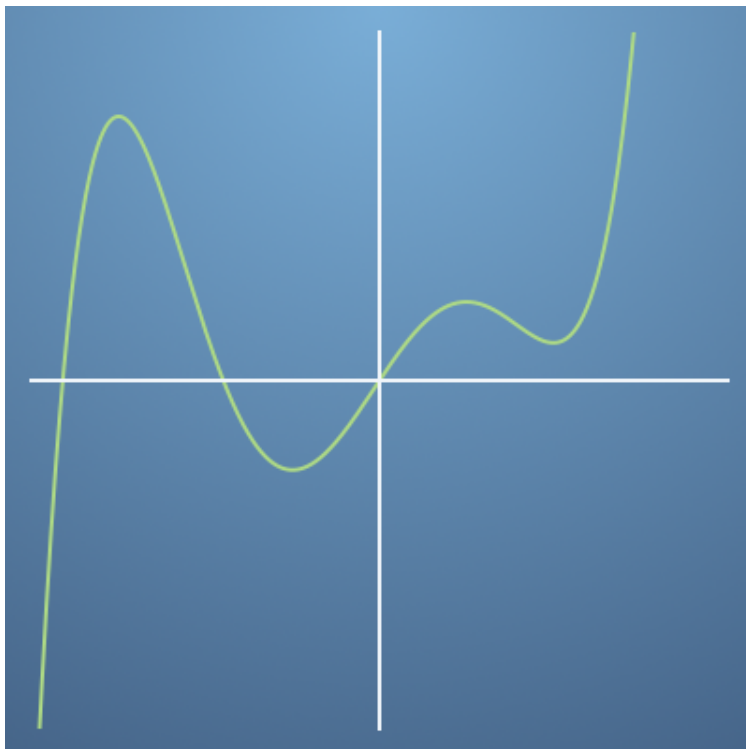
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**Correct**

Well done! If one function is a vertical shift of another function, then they have the same differential.

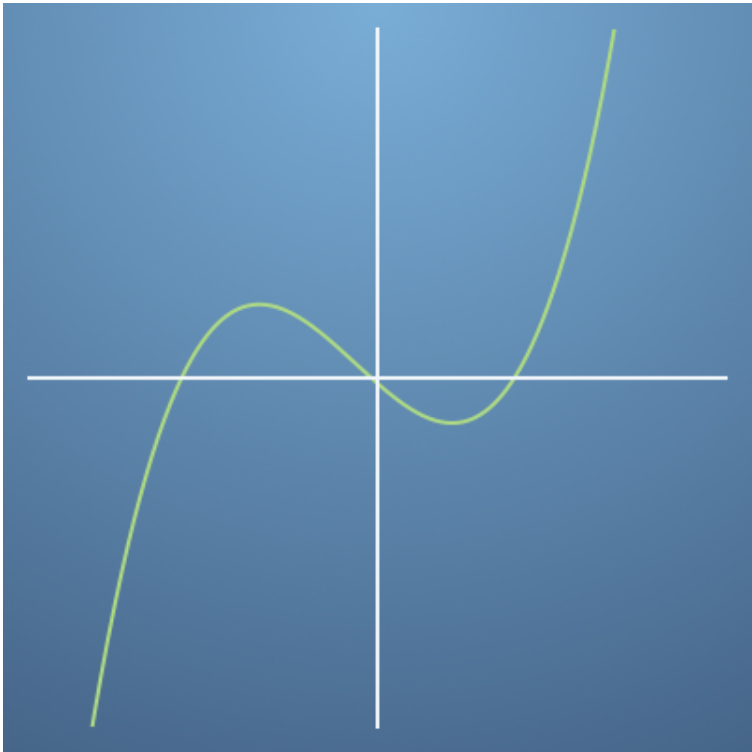


Matching the graph of a function to the graph of its derivative

Well done! If one function is a vertical shift of another function, then they have the same differential.

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Un-selected is correct