§1.4: THE DERIVATIVE FUNCTION

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PREP ACTIVITY DISCUSSION

What patterns did you find as you used the limit definiton to compute $f'(0)$, $f'(1)$, $f'(2)$, and $f'(3)$?

$f = 4x - x^2$

THE BIG IDEA

Given a function f and a point a in its domain, we can compute

$$f'(a) = \lim_{h \to 0} \frac{f(a+h) - f(a)}{h}.$$

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So, let a vary over the entire domain of f.

graphically?

THE DEFINITION

Definition

Let f be a function and x a value in the function's domain. We define the **derivative of** f, a new function called f', by the formula

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}.$$

A QUESTION

Given a graph of $y = f(x)$, how does this graph yield a graph of $y = f'(x)$?

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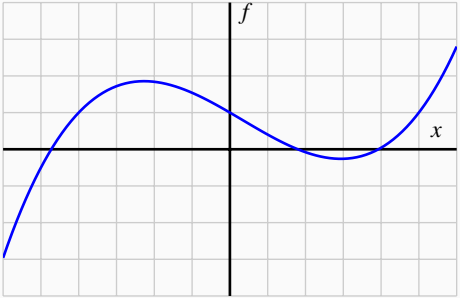
Work on **Activity 1.4.2**.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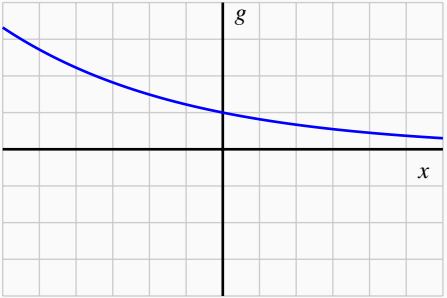
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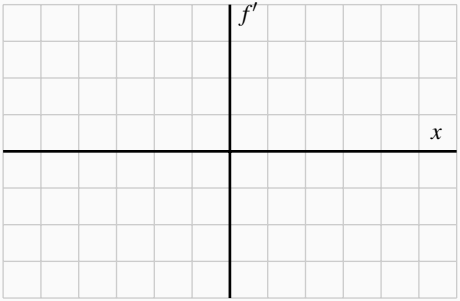
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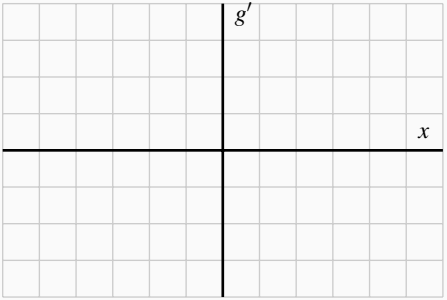
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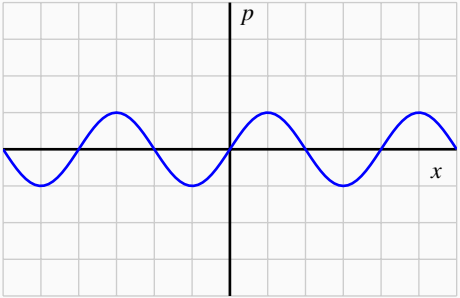
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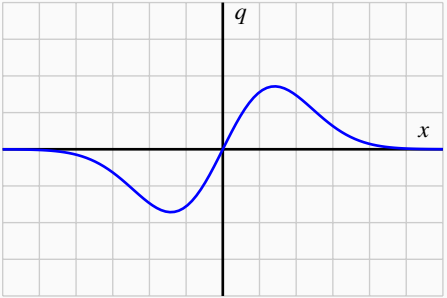
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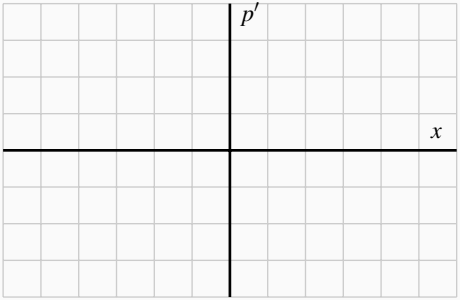
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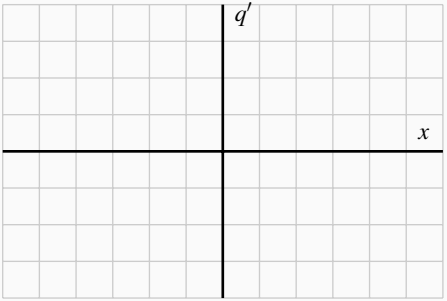
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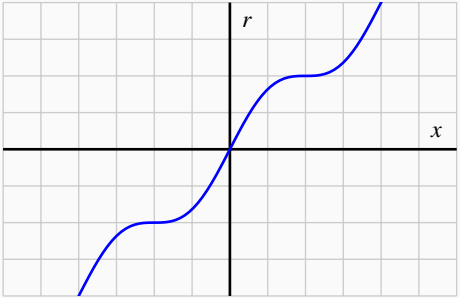
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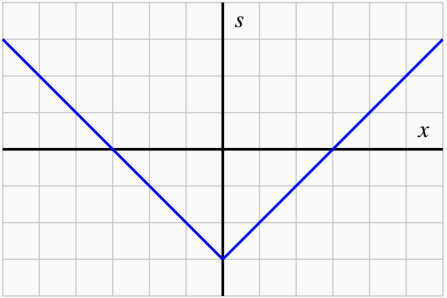
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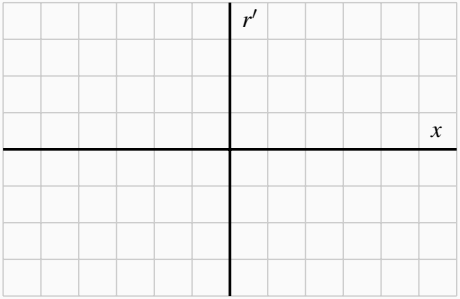
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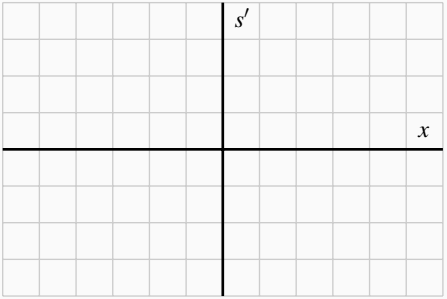
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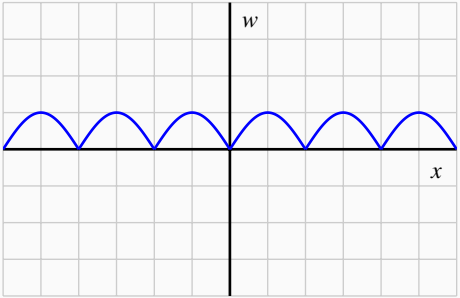
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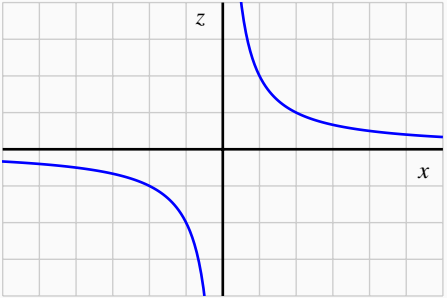
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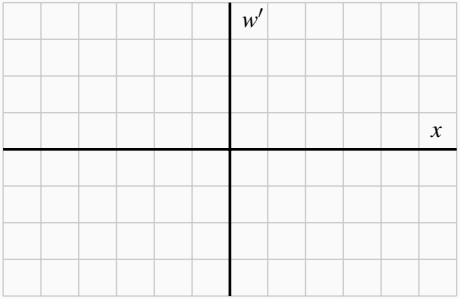
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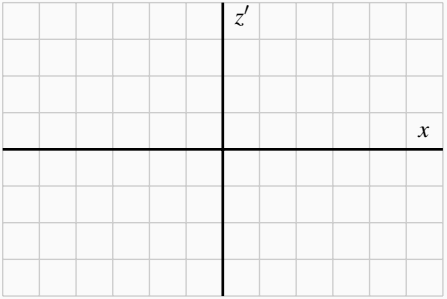
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REMINDERS FOR NEXT TIME

ANOTHER QUESTION

Given a formula for $y = f(x)$, how does the limit definition of the derivative yield a formula for $y = f'(x)$?

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Work on **Activity 1.4.3**.

FOR NEXT TIME

- Prep 1.5
- Edfinity 1.4