Power Rule

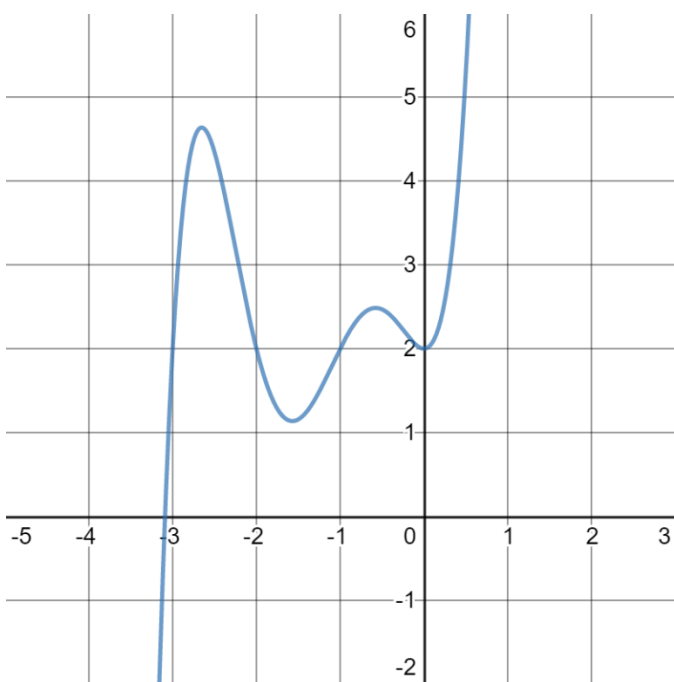| |
|---|
| **Goal**: |
| • Can use power rule to take the derivative of monomials |
| • Can see the pattern that builds towards the general power rule |
| **Terminology**: |
| • Power rule |
| **Reminders** |
| • Quiz on Thursday on 2.1-2.3 |

Review: 1. Given f below, determine $\frac{df}{dx}$ when $x \neq 1$ and $f'(1)$.

$$f(x) = \begin{cases} x^2, & x \neq 1 \\ 2, & x = 1 \end{cases}$$

2. Given the graph of g, graph g'.

We want to be able to take the derivative of powers without having to use a limit every time. On the board work to find

$$\frac{d}{dx}x^n$$

Using limits so we don't have to use limits again.

Function	Derivative by Power Rule	Derivative by Limits
$y = x$		
$y = x^2$		
$y = x^3$		
$y = 5x^4$		
$y = \dfrac{3}{\sqrt{x}}$		

Practice Problems: 2.2: # 1-2 (do what you need), 4-8, 11

🌶️ # 9, 12

In Class Evidence

5. Use the definition of the derivative to show that if $f(x) = \frac{1}{x}$ then $f'(x) = -\frac{1}{x^2}$

6. Use the definition of the derivative to show that if $f(x) = \sqrt{x}$ then $f'(x) = \frac{1}{2\sqrt{x}}$

9. At what point on the curve $y = -2x^4$ is the tangent line perpendicular to the line $x - y + 1 = 0$?

11. Draw a diagram to show that there are two tangent lines to the parabola $y = x^2$ that pass through the point $(0, -5)$. Find the coordinates of the points where these tangent lines meet the parabola.