

## CALCULATING DERIVATIVES

**Theorem.** If  $n \neq 0$ ,  $\frac{d}{dx}[x^n] = nx^{n-1}$

1. Find the derivatives:

a)  $\frac{d}{dx}[x^4]$

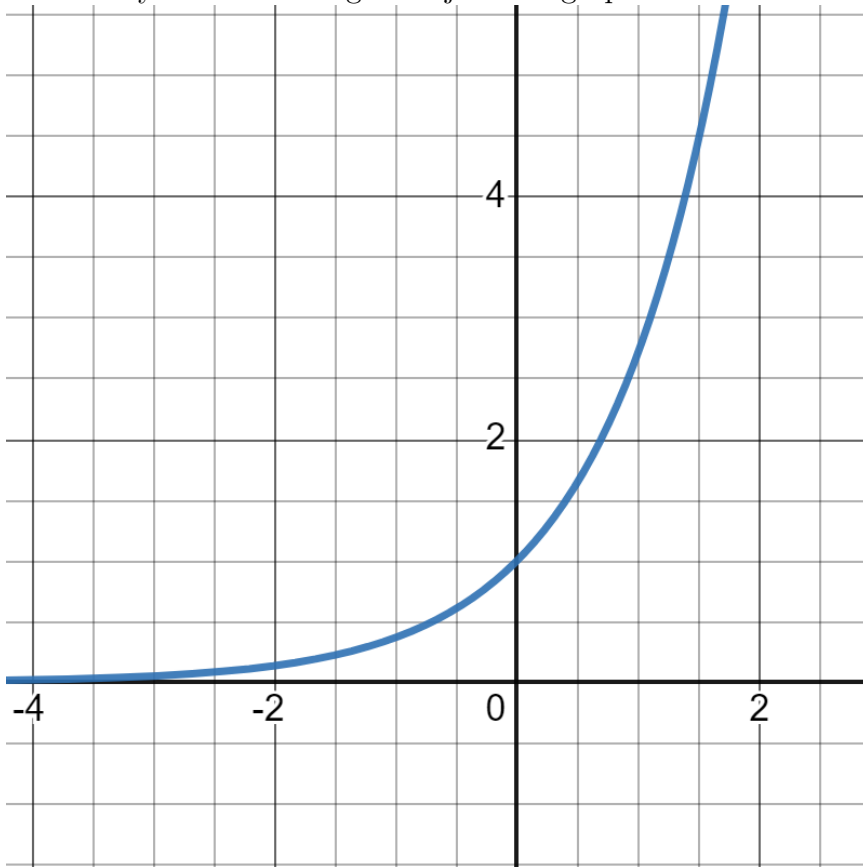
b)  $\frac{d}{dx}[x^{2023}]$

c)  $\frac{d}{dx}\left[\frac{1}{x}\right]$

d)  $\frac{d}{dx}[\sqrt[3]{x}]$

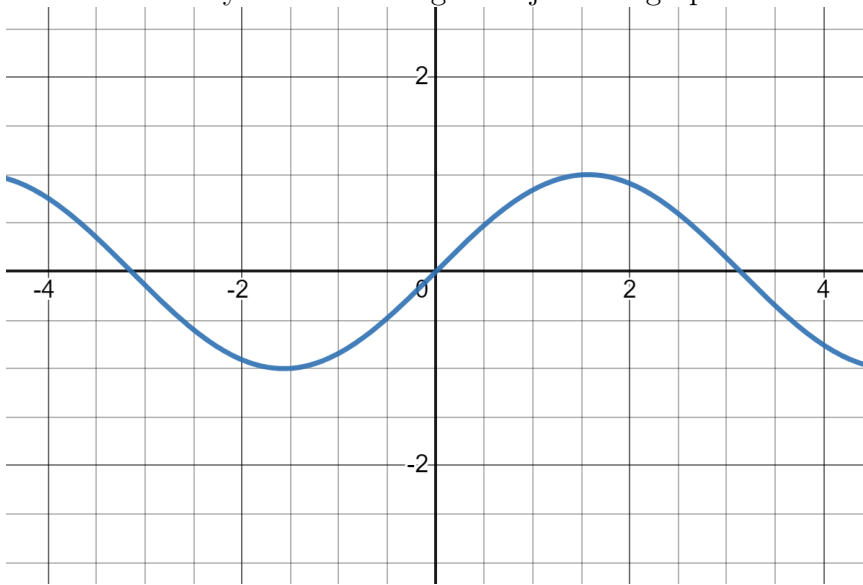
e)  $\frac{d}{dx}\left[\frac{1}{\sqrt{x}}\right]$

2. Shown below is the graph  $y = f(x)$  for  $f(x) = e^x$ . Sketch the graph  $y = f'(x)$  on the same axes. Be as accurate as you can working from just the graph.



Date: October 2, 2023.

3. Shown below is the graph  $y = f(x)$  for  $f(x) = \sin(x)$ . Sketch the graph  $y = f'(x)$  on the same axes. Be as accurate as you can working from just the graph.



4. Shown below is the graph  $y = f(x)$  for  $f(x) = \cos(x)$ . Sketch the graph  $y = f'(x)$  on the same axes. Be as accurate as you can working from just the graph.

