Name: Richard

Quiz 7

MATH 200
September 11, 2025

1. This problem concerns the function $f(x) = 4 + 2e^x - \sqrt[3]{x}^2$. $= 4 + 2e^x - x^{\frac{2}{3}}$

   (a) Find $f'(x)$.

   $f'(x) = 0 + 2e^x - \frac{2}{3}x^{-1/3} = \boxed{2e^x - \frac{2}{3\sqrt[3]{x}}}$ ✓

   (b) State the intervals on which the function $f(x)$ is differentiable.

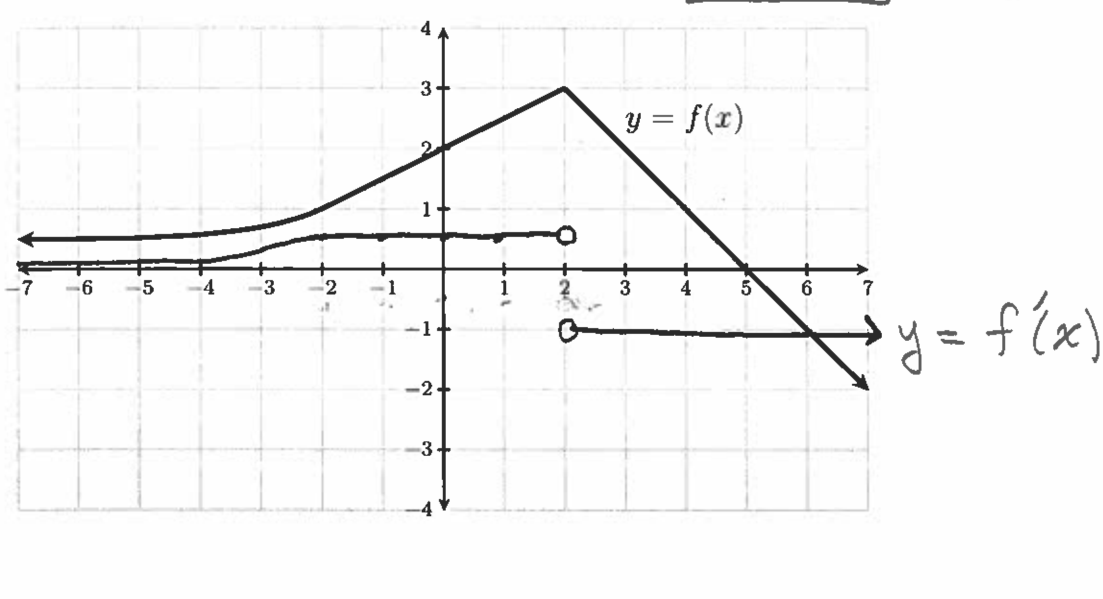
   $f'(0)$ is not defined (division by 0) but $f'(x)$ is defined for all other values of x.

   $\therefore$ $\boxed{f \text{ is differentiable on } (-\infty, 0) \cup (0, \infty)}$

2. The graph of a function $f(x)$ is shown below.

   (a) Using the same coordinate axis, sketch the graph of its derivative $f'(x)$

   (b) At which x values is $f(x)$ **not** differentiable? $\boxed{x = 2}$



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1. This problem concerns the function $g(x) = 3\sqrt[3]{x}^2 - 6 + 2e^x$. $= 3x^{\frac{2}{3}} - 6 + 2e^x$

   (a) Find $g'(x)$.

   $$g'(x) = 3 \cdot \frac{2}{3} x^{-1/3} - 0 + 2e^x = \boxed{\frac{2}{\sqrt[3]{x}} + 2e^x}$$

   (b) State the intervals on which the function $g(x)$ is differentiable.

   $g'(0)$ is not defined (division by 0) but $g'(x)$ is defined for all values of $x \neq 0$.

   $\therefore$ $\boxed{g(x) \text{ is differentiable on } (-\infty, 0) \cup (0, \infty)}$

2. The graph of a function $g(x)$ is shown below.

   (a) Using the same coordinate axis, sketch the graph of its derivative $g'(x)$

   (b) At which x value(s) is $g(x)$ **not** differentiable? $\boxed{x = -2}$