

Name: _____

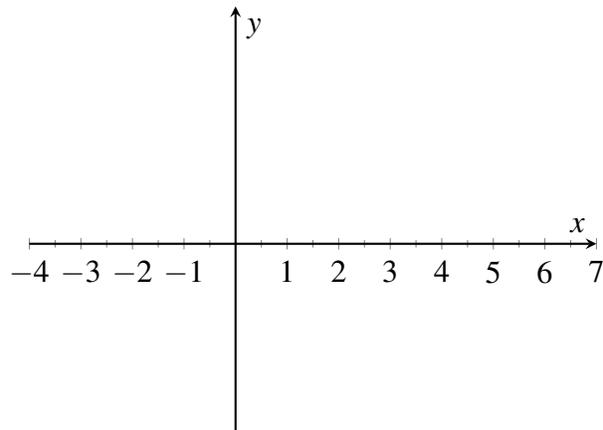
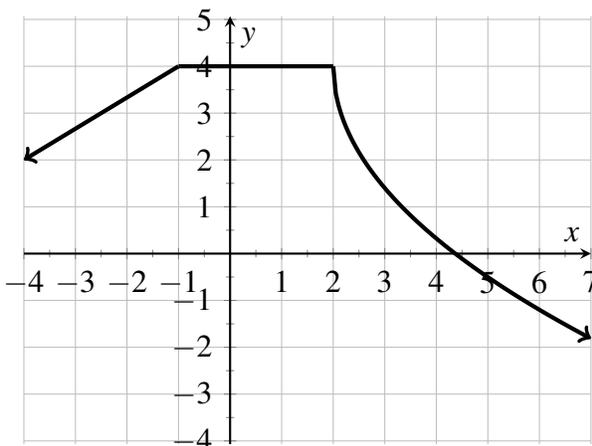
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There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. [8 points] Use the **limit definition** (given below) of the derivative to find the derivative of $f(x) = \frac{2}{x^2}$. **No credit will be awarded for a solution that does not use the definition below.** Show all your work clearly, step by step, using correct notation.

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

2. [5 points] The graph of $f(x)$ is shown below. On the **other set of axes**, sketch the graph of $f'(x)$. If there are any asymptotes, draw them with dashed lines. Use open circles to show points where the derivative is not defined, if any. (You are not given values on the y-axis; I am interested in the correct shape/holes/asymptotes of the derivative, not the specific values.)



3. [6 points] Use the derivative rules to find the derivative for each function below. **Do not simplify your answer.** Show work so someone else can follow your thinking.

a. $f(x) = (\cos x)(\sqrt{x} - 2x)$

$$f'(x) =$$

b. $g(x) = \frac{x^3 - 2x + 1}{x}$

$$g'(x) =$$

4. [6 points] For the function $F(x) = x^3 - \sin x$, find $F'(x)$, $F''(x)$, and $F'''(x)$.

$$F'(x) =$$

$$F''(x) =$$

$$F'''(x) =$$