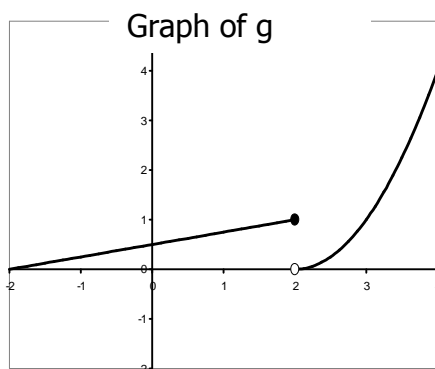
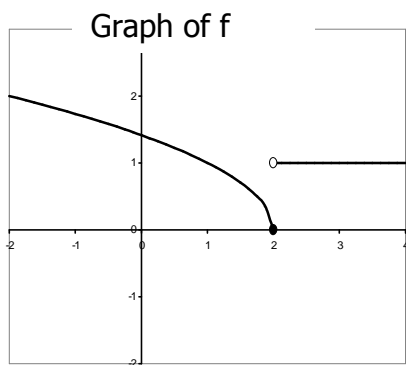


NAME _____

Given the functions f and g (defined graphically) and h , j and k (defined algebraically), compute each of the following limits, or state why they do not exist.



$$h(x) = \frac{x^2 - 4}{x - 2}$$

$$j(x) = \begin{cases} 1 & \text{if } x < 2 \\ 0 & \text{if } x \geq 2 \end{cases}$$

$$k(x) = x^2$$

SHOW STEPS!! Hint: You will need to use one-sided limits!!

1. $\lim_{x \rightarrow 2} [f(x) + g(x)]$

2. $\lim_{x \rightarrow 2} [f(x) \cdot g(x)]$

3. $\lim_{x \rightarrow 2} [g(x) - j(x)]$

4. $\lim_{x \rightarrow 2} [g(x) + j(x)]$

5. In general, if $\lim_{x \rightarrow a} m(x)$ exists and $\lim_{x \rightarrow a} n(x)$ exists, is it always true that $\lim_{x \rightarrow a} [m(x) + n(x)]$ exists? Justify your answer. If it is true, which limit law from your text you applied. If it is not true provide a counterexample.

6. In general, if $\lim_{x \rightarrow a} m(x)$ does not exist and $\lim_{x \rightarrow a} n(x)$ does not exist, is it always true that $\lim_{x \rightarrow a} [m(x) + n(x)]$ does not exist? Justify your answer. If it is true, which limit law from your text you applied. If it is not true provide a counterexample.