

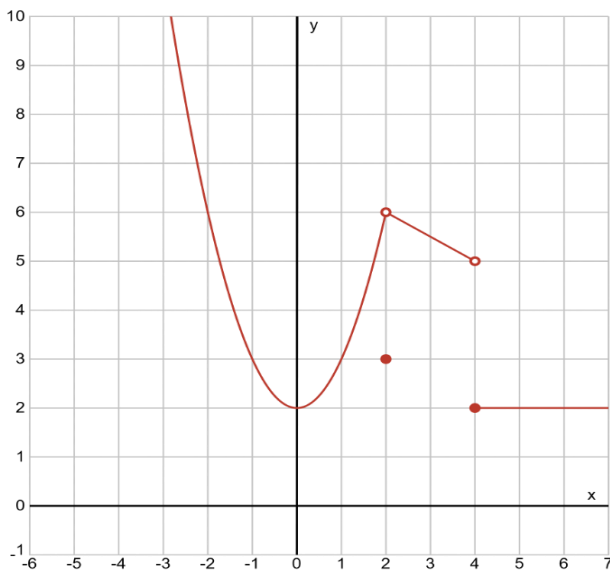
Chapter 2 Problem Set

NO CALCULATOR IS ALLOWED FOR THESE QUESTIONS

1. Let f be a function defined by $f(x) = \begin{cases} 4x-7 & \text{for } x \leq 2 \\ e^{x-2} & \text{for } x > 2 \end{cases}$.

Show that f is continuous at $x = 2$.

2. Use the graph of f shown to answer the following questions.



Part A: Find $\lim_{x \rightarrow 4^-} f(x)$.

Part B: Find $\lim_{x \rightarrow 4^+} f(x)$.

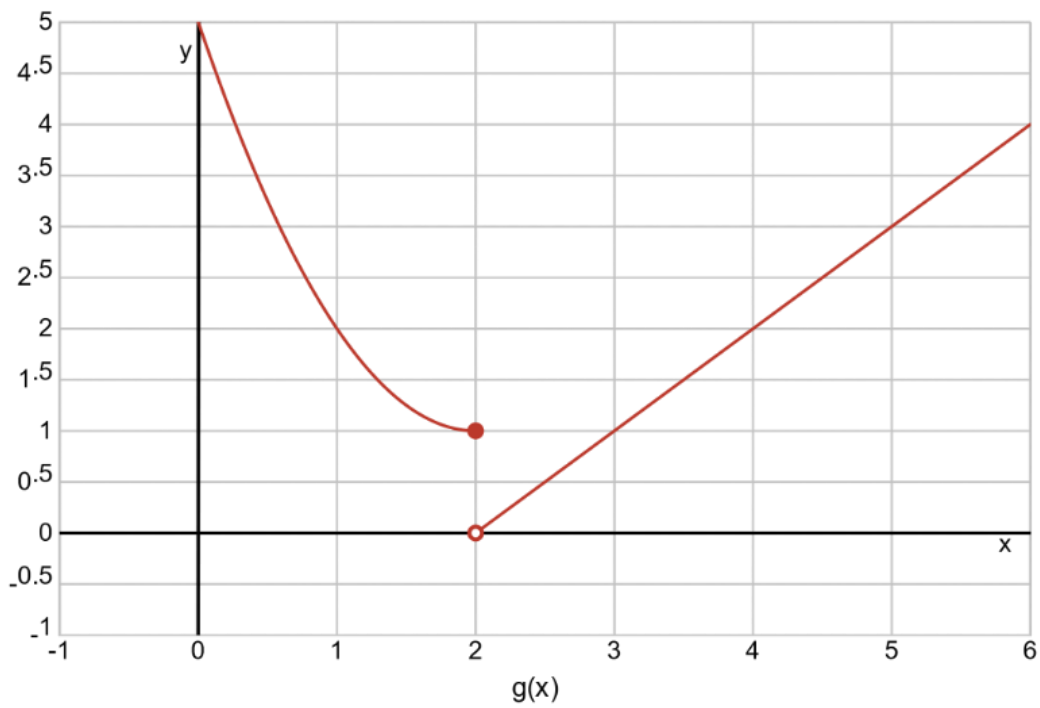
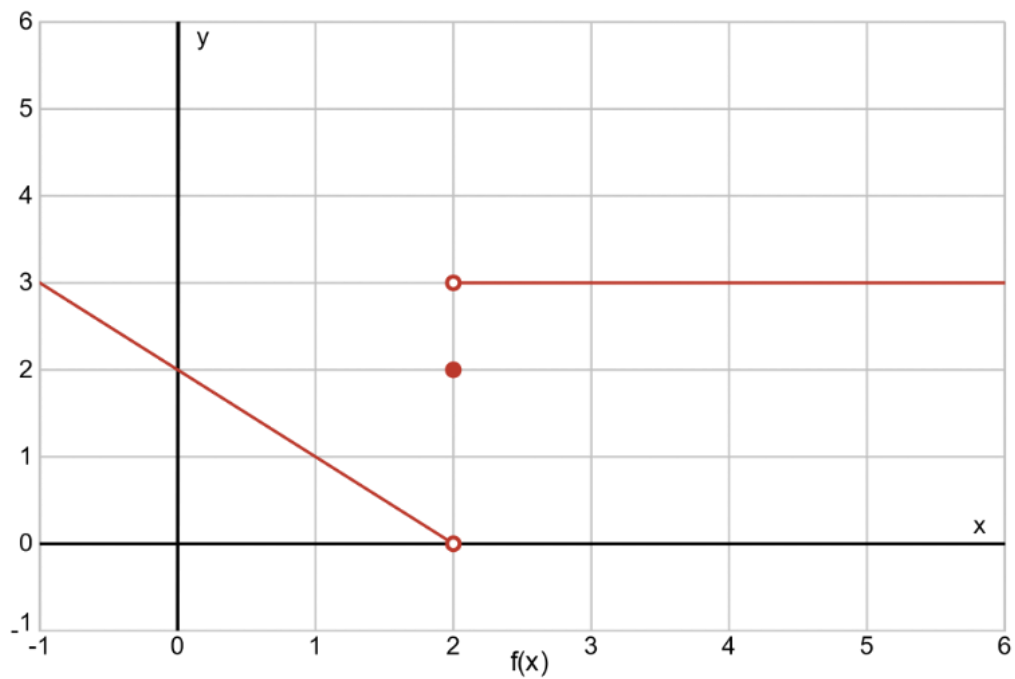
Part C: Find $\lim_{x \rightarrow 2} f(x)$.

3. Find the limit (if it exists).

Part A: $\lim_{x \rightarrow 0} \frac{\sin(2x)}{3x}$

Part B: $\lim_{x \rightarrow 4} \frac{\sqrt{x-3}-1}{x-4}$

4. Use the graph of $f(x)$ and $g(x)$ to find $\lim_{x \rightarrow 2} [f(x) \cdot g(x)]$.



5.) The piecewise function $h(x)$ is given. Find the value of k that makes $h(x)$ continuous on $(-3, \infty)$.

$$h(x) = \begin{cases} \frac{x-3}{x^2-9} & \text{for } x \neq -3, 3 \\ k & \text{for } x = 3 \end{cases}$$

6). Given $y = \sqrt{x^2 - 1}$ find:

a) the average rate of change of f on the interval $[-1, a]$

b) the instantaneous rate of change of f at $x = 2$