

Ex 1. Evaluate the following limits if they exist. If a limit does not exist, write DNE.

a) $\lim_{x \rightarrow 2} \frac{4(x^2 - 4)}{x - 2}$

b) $\lim_{x \rightarrow 4} \frac{x^2 - 16}{\sqrt{x} - 4}$

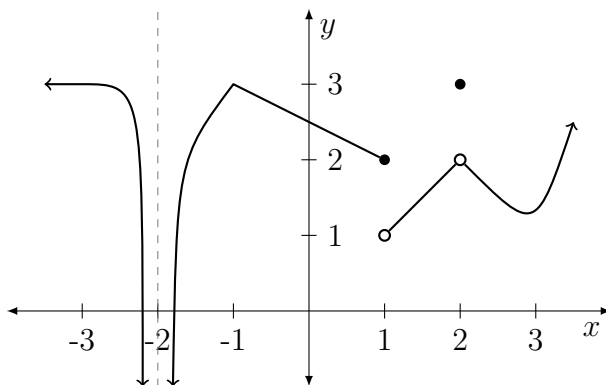
c) $\lim_{x \rightarrow 0} \frac{1 - \frac{1}{x^2}}{\frac{1}{x} + \frac{1}{x^2}}$

d) $\lim_{x \rightarrow 0} \frac{1}{x}$

e) $\lim_{h \rightarrow 0} \frac{(x + h)^2 - x^2}{h}$

f) $\lim_{x \rightarrow \infty} \frac{5x^7 + 2x^3 + x}{1 + 7x^2 + 3x^7}$

Question 2. Based on the graph of $f(x)$ shown below, determine the following limits.



a) $\lim_{x \rightarrow -2} f(x) =$ _____

b) $\lim_{x \rightarrow 1^+} f(x) =$ _____

c) $\lim_{x \rightarrow 1} f(x) =$ _____

d) $\lim_{x \rightarrow 2} f(x) =$ _____

Question 3. Use the definition of continuity to show what number k makes the following function continuous at $x = 2$.

$$f(x) = \begin{cases} \frac{x-2}{x^2-4} & x \neq 2 \\ k & x = 2 \end{cases}$$