

Quiz # 3 — 09/15/16

Answer all questions in a clear and concise manner. Remember that answers without explanation or that are poorly presented may not receive full credit.

1. Pictured below is the graph of $y = f(x)$. Which of the following is true?

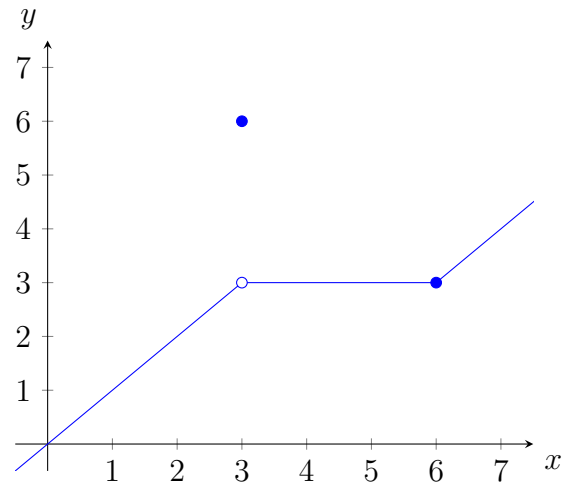
(a) f is continuous at $x = 3$

(b) $\lim_{x \rightarrow 3} f(x) = 3$

(c) $\lim_{x \rightarrow 3} f(x) = 6$

(d) f is not continuous at $x = 6$

(e) None of the above



2. Compute the following limits. Justify each step.

(a) $\lim_{x \rightarrow 2} \frac{x^2 + 5x - 14}{x - 2}$

$$\begin{aligned} \lim_{x \rightarrow 2} \frac{x^2 + 5x - 14}{x - 2} &= \lim_{x \rightarrow 2} \frac{(x - 2)(x + 7)}{x - 2} \\ &= \lim_{x \rightarrow 2} x + 7 \\ &= 9 \end{aligned}$$

(b) $\lim_{x \rightarrow \infty} \frac{x^3 + 2700x - 1}{3x^3 + 2x^2 + 1}$

$$\begin{aligned} \lim_{x \rightarrow \infty} \frac{x^3 + 2700x - 1}{3x^3 + 2x^2 + 1} &= \lim_{x \rightarrow \infty} \frac{x^3(1 + \frac{2700}{x^2} - \frac{1}{x^3})}{x^3(3 + \frac{2}{x} + \frac{1}{x^3})} \\ &= \lim_{x \rightarrow \infty} \frac{1 + \frac{2700}{x^2} - \frac{1}{x^3}}{3 + \frac{2}{x} + \frac{1}{x^3}} \\ &= \frac{1}{3} \end{aligned}$$