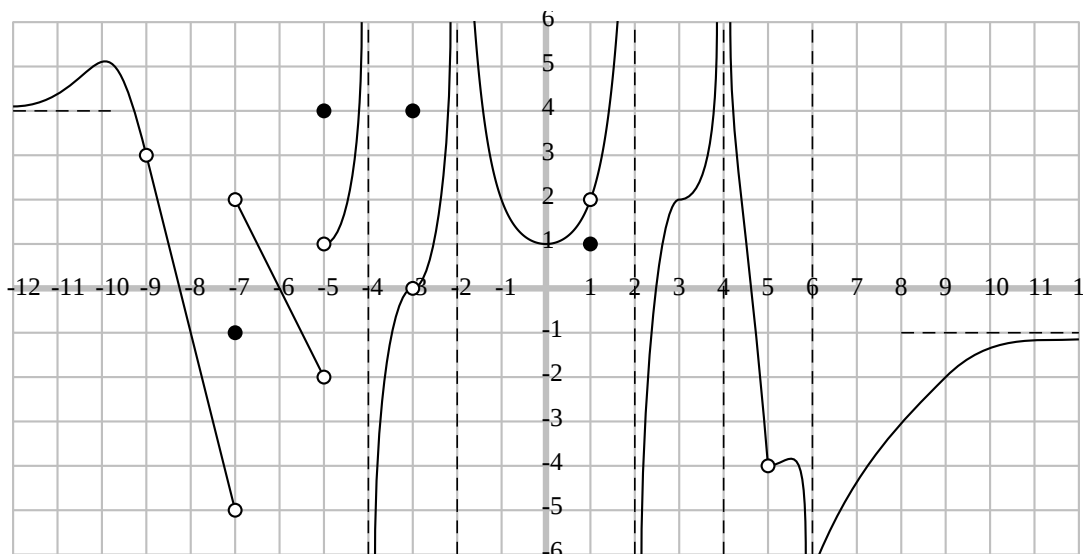


1.



Not all quizzes asked the same questions, but your answers should be on this list. You should understand all the limits given below (and one-sided versions of them even if they're not given). For these questions, you can say "is undefined" or "does not exist" interchangeably.

$$\lim_{x \rightarrow -\infty} f(x) = 4$$

$$\lim_{x \rightarrow -9} f(x) = 3$$

$$\lim_{x \rightarrow -9^-} f(x) = 3$$

$$\lim_{x \rightarrow -9^+} f(x) = 3$$

$$\lim_{x \rightarrow -7} f(x) \text{ is undefined}$$

$$\lim_{x \rightarrow -7^-} f(x) = -5$$

$$\lim_{x \rightarrow -7^+} f(x) = 2$$

$$\lim_{x \rightarrow -5} f(x) \text{ is undefined}$$

$$\lim_{x \rightarrow -5^-} f(x) = -2$$

$$\lim_{x \rightarrow -5^+} f(x) = 1$$

$$\lim_{x \rightarrow -4^+} f(x) = -\infty$$

$$\lim_{x \rightarrow -4^-} f(x) = \infty$$

$$\lim_{x \rightarrow -4} f(x) \text{ is undefined}$$

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

$$\lim_{x \rightarrow 1} f(x) = 2$$

$$\lim_{x \rightarrow 2} f(x) \text{ does not exist}$$

$$\lim_{x \rightarrow 4} f(x) = \infty$$

$$\lim_{x \rightarrow 5} f(x) = -4$$

$$\lim_{x \rightarrow 6} f(x) = -\infty$$

$$\lim_{x \rightarrow \infty} f(x) = -1$$

2. Your quiz question was similar to one of these, possibly with different numbers:

$$f(x) = \begin{cases} 2x & \text{if } x \leq 5 \\ c & \text{if } x > 5. \end{cases}$$

The function is continuous everywhere, except possibly at $x = 5$ (no matter what c is). Also, $f(5) = 10$ and $\lim_{x \rightarrow 5^-} f(x) = 10$ and $\lim_{x \rightarrow 5^+} f(x) = c$. We want $\lim_{x \rightarrow 5} f(x)$ to exist and to equal $f(5)$. To make this happen, we need $c = 10$. That makes both one-sided limits 10, so the two-sided limit exists and is 10. Enough work for you to write: $f(5) = 10$ and $\lim_{x \rightarrow 5^-} f(x) = 10$ and $\lim_{x \rightarrow 5^+} f(x) = c$, so $c = 10$.

$$f(x) = \begin{cases} c & \text{if } x < 1 \\ x^2 + 4 & \text{if } x \geq 1. \end{cases}$$

The function is continuous everywhere, except possibly at $x = 1$ (no matter what c is). Also, $f(1) = 5$ and $\lim_{x \rightarrow 1^-} f(x) = c$ and $\lim_{x \rightarrow 1^+} f(x) = 5$. We want the limit $\lim_{x \rightarrow 1} f(x)$ to exist and to equal $f(1)$. To make this happen, we need $c = 5$. That makes both one-sided limits 5, so the two-sided limit exists and is 5. Enough work for you to write: $f(1) = 5$ and $\lim_{x \rightarrow 1^-} f(x) = c$ and $\lim_{x \rightarrow 1^+} f(x) = 5$, so $c = 5$.