

Exercise 1

Explain in your own words the meaning of each of the following.

$$(a) \lim_{x \rightarrow \infty} f(x) = 5 \qquad (b) \lim_{x \rightarrow -\infty} f(x) = 3$$

Solution

Part (a)

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

As x becomes very large, $f(x)$ approaches 5. In other words, $y = 5$ is a horizontal asymptote of the function to the right.

Part (b)

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

As x becomes very large and negative, $f(x)$ approaches 3. In other words, $y = 3$ is a horizontal asymptote of the function to the left.