

Limits (Precise) Practice

Name: _____

Date: _____

Question 1

Solve

- l. interval point c
(-3.5, -0.5) -1.5

Question 2

Solve

- l. $f(x) = \sqrt{x}$ $c = 1$ $L = 1$ $\epsilon = 1/4$

Question 3

Solve

- l. $f(x) = -3x - 2$ $c = -1$ $\epsilon = 0.03$

Limits (Precise) Practice

Name: _____ **Key** _____

Date: _____

Question 1

Solve

l. interval $(-3.5, -0.5)$ point $c = -1.5$

$$|x - (-1.5)| < \delta \rightarrow -\delta < x + 1.5 < \delta \rightarrow -\delta - 1.5 < x < \delta - 1.5$$
$$-\delta - 1.5 = -3.5 \rightarrow \delta = 2 \text{ Larger Value}$$
$$\delta - 1.5 = -0.5 \rightarrow \delta = 1 \text{ Smaller Value}$$

$\delta = 1$ or any smaller positive value

Question 2

Solve

l. $f(x) = \sqrt{x}$ $c = 1$ $L = 1$ $\epsilon = 1/4$

$$|(\sqrt{x}) - 1| < 1/4 \rightarrow -1/4 < \sqrt{x} - 1 < 1/4 \rightarrow 3/4 < \sqrt{x} < 5/4 \rightarrow 9/16 < x < 25/16$$
$$|x - (1)| < \delta \rightarrow -\delta < x - 1 < \delta \rightarrow -\delta + 1 < x < \delta + 1$$
$$-\delta + 1 = 9/16 \rightarrow \delta = 7/16 \text{ Smaller Value}$$
$$\delta + 1 = 25/16 \rightarrow \delta = 9/16 \text{ Larger Value}$$

$\delta = 7/16$ or any smaller positive value

Question 3

Solve

l. $f(x) = -3x - 2$ $c = -1$ $\epsilon = 0.03$

$$-3(-1) - 2 \rightarrow 1 = L$$
$$|(-3x - 2) - 1| < 0.03 \rightarrow -0.03 < -3x - 3 < 0.03 \rightarrow 2.97 < -3x < 3.03 \rightarrow -0.99 > x > -1.01$$
$$|x - (-1)| < \delta \rightarrow -\delta < x + 1 < \delta \rightarrow -\delta - 1 < x < \delta - 1$$
$$-\delta - 1 = -1.01 \rightarrow \delta = 0.01$$
$$\delta - 1 = -0.99 \rightarrow \delta = 0.01$$

$\delta = 0.01$ or any smaller positive value