

Watch. Practice. Understand. | Lesson 259

Calculus 2 2 Limit and One Sided Limit

Watch the matching video: <https://www.youtube.com/watch?v=gOTF3WhC0qY>

Practice focus: Limits and one-sided limits

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Find $\lim_{x \rightarrow 3} \frac{(x^2 - 9)}{(x - 3)}$.

02 Find $\lim_{x \rightarrow 0} \sin x / x$, using radians.

03 Find the left and right limits of $|x|/x$ at 0. Does the two-sided limit exist?

04 If $f(x)=x+2$ for $x<1$ and $f(x)=4-x$ for $x\geq 1$, find $\lim_{x \rightarrow 1} f(x)$.

Worked answers | Lesson 259

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Original extra practice matched to the listed lesson topic.

01 Find $\lim_{x \rightarrow 3} (x^2 - 9)/(x - 3)$.

Cancel $x - 3$ for $x \neq 3$ to obtain $x + 3$. Limit: 6.

02 Find $\lim_{x \rightarrow 0} \sin x / x$, using radians.

The fundamental trigonometric limit is 1.

03 Find the left and right limits of $|x|/x$ at 0. Does the two-sided limit exist?

For $x < 0$, value -1; for $x > 0$, value 1. Unequal one-sided limits mean the two-sided limit does not exist.

04 If $f(x) = x + 2$ for $x < 1$ and $f(x) = 4 - x$ for $x \geq 1$, find $\lim_{x \rightarrow 1} f(x)$.

Left limit 3 and right limit 3 agree, so the limit is 3.