

Calculus 2 4 The Precise Definition of Limit with Epsilon and Delta

Lesson 266 | Calculus AB | Epsilon-delta limits

<https://www.youtube.com/watch?v=RQVIZlgDHhs>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

For $f(x)=12x+10$, prove $\lim_{x \rightarrow 4} f(x)=58$ using an epsilon-delta argument.

02

For $f(x)=6x+8$, prove $\lim_{x \rightarrow 6} f(x)=44$ using an epsilon-delta argument.

03

For $f(x)=7x+14$, prove $\lim_{x \rightarrow 2} f(x)=28$ using an epsilon-delta argument.

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04

For $f(x)=3x+7$, prove $\lim_{x \rightarrow 3} f(x)=16$ using an epsilon-delta argument.

05

For $f(x)=7x+14$, prove $\lim_{x \rightarrow 3} f(x)=35$ using an epsilon-delta argument.

06

For $f(x)=9x+7$, prove $\lim_{x \rightarrow 4} f(x)=43$ using an epsilon-delta argument.

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01

For $f(x)=12x+10$, prove $\lim_{x \rightarrow 4} f(x)=58$ using an epsilon-delta argument.

Given $\epsilon > 0$, choose $\delta = \epsilon/12$. If $0 < |x-4| < \delta$, then $|f(x)-58| = 12|x-4| < 12\delta = \epsilon$. This meets the definition.

02

For $f(x)=6x+8$, prove $\lim_{x \rightarrow 6} f(x)=44$ using an epsilon-delta argument.

Given $\epsilon > 0$, choose $\delta = \epsilon/6$. If $0 < |x-6| < \delta$, then $|f(x)-44| = 6|x-6| < 6\delta = \epsilon$. This meets the definition.

03

For $f(x)=7x+14$, prove $\lim_{x \rightarrow 2} f(x)=28$ using an epsilon-delta argument.

Given $\epsilon > 0$, choose $\delta = \epsilon/7$. If $0 < |x-2| < \delta$, then $|f(x)-28| = 7|x-2| < 7\delta = \epsilon$. This meets the definition.

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04

For $f(x)=3x+7$, prove $\lim_{x \rightarrow 3} f(x)=16$ using an epsilon-delta argument.

Given $\epsilon > 0$, choose $\delta = \epsilon/3$. If $0 < |x-3| < \delta$, then $|f(x)-16| = 3|x-3| < 3\delta = \epsilon$. This meets the definition.

05

For $f(x)=7x+14$, prove $\lim_{x \rightarrow 3} f(x)=35$ using an epsilon-delta argument.

Given $\epsilon > 0$, choose $\delta = \epsilon/7$. If $0 < |x-3| < \delta$, then $|f(x)-35| = 7|x-3| < 7\delta = \epsilon$. This meets the definition.

06

For $f(x)=9x+7$, prove $\lim_{x \rightarrow 4} f(x)=43$ using an epsilon-delta argument.

Given $\epsilon > 0$, choose $\delta = \epsilon/9$. If $0 < |x-4| < \delta$, then $|f(x)-43| = 9|x-4| < 9\delta = \epsilon$. This meets the definition.