

Watch. Practice. Understand. | Lesson 267

Calculus 2 6 Limit at Infinity Part I

Watch the matching video: <https://www.youtube.com/watch?v=zZOMfrWQh84>

Practice focus: Limits at infinity

Original extra practice matched to the listed lesson topic.

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

01 Find $\lim$ as $x \rightarrow \infty$ of $(3x^2 + 1)/(2x^2 - 5)$.

02 Find $\lim$ as $x \rightarrow \infty$ of $(2x + 1)/(x^2 + 4)$.

03 Find $\lim$ as $x \rightarrow \infty$ of $\sqrt{(x^2 + 1)}/x$.

04 Find $\lim$ as $x \rightarrow \text{negative infinity}$ of $\sqrt{(x^2 + 1)}/x$.

Worked answers | Lesson 267

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01 Find $\lim$ as $x \rightarrow \infty$ of $(3x^2 + 1)/(2x^2 - 5)$.

Divide by x^2 ; lower-order terms vanish. Limit $3/2$.

02 Find $\lim$ as $x \rightarrow \infty$ of $(2x + 1)/(x^2 + 4)$.

Denominator degree is larger; divide by x^2 to obtain limit 0.

03 Find $\lim$ as $x \rightarrow \infty$ of $\sqrt{(x^2 + 1)}/x$.

For $x > 0$, rewrite as $\sqrt{(1 + 1/x^2)}$; limit 1.

04 Find $\lim$ as $x \rightarrow \text{negative infinity}$ of $\sqrt{(x^2 + 1)}/x$.

$\sqrt{(x^2)} = |x| = -x$ for negative x . Expression becomes $-\sqrt{(1 + 1/x^2)}$; limit -1.