

Calculus

Chapter 2: Limits and Continuity

Lesson 3: Limits Involving Infinity

Question #1

Reference Q.187

Evaluate this limit: $\lim_{x \rightarrow +\infty} \sqrt[3]{x}$

Question #2

Reference Q.188

Evaluate this limit: $\lim_{x \rightarrow +\infty} (5x^6 - 3x^2 + 1)$

Question #3

Reference Q.189

Evaluate: $\lim_{m \rightarrow -\infty} \frac{2}{m-6}$

Question #4

Reference Q.190

Evaluate $\lim_{m \rightarrow +\infty} \frac{4m-3}{2m-1}$

Question #5

Reference Q.191

Evaluate: $\lim_{x \rightarrow -\infty} \frac{2x-1}{3x^2+2x-2}$

Question #6

Reference Q.192

Evaluate $\lim_{h \rightarrow -\infty} \frac{3+h}{\sqrt{h^2-2}}$

Question #7

Reference Q.193

Evaluate the limit $\lim_{x \rightarrow +\infty} \frac{\sin(3x)}{4x+5}$

Question #8

Reference Q.194

Evaluate this function: $\lim_{x \rightarrow -\infty} \frac{\sqrt{x^4+107x}}{2x^2-3x+1}$

Question #9

Reference Q.195

Evaluate this limit: $\lim_{x \rightarrow +\infty} \sqrt{\frac{x^3+4x^2-2x+1}{3x^3-2x}}$

Question #10

Reference Q.196

Intuitively, evaluate $\lim_{x \rightarrow -\infty} \frac{-x^7+5x+13}{2x+13}$

Question #11

Reference Q.197

Evaluate $\lim_{t \rightarrow +\infty} \frac{3t^3-2t^2+5t+6}{15t^3-6t+17}$

Question #12

Reference Q.198

Evaluate the limit: $\lim_{x \rightarrow +\infty} 5x - \sqrt{x^2 - 4x + 1}$

Question #13

Reference Q.199

Evaluate: $\lim_{x \rightarrow 3^-} \left[\frac{1}{x-3} - \frac{1}{x^2-9} \right]$

Question #14

Reference Q.200

Evaluate $\lim_{m \rightarrow 5^+} \ln(m-5)$

Question #15

Reference Q.201

Evaluate $\lim_{x \rightarrow \frac{\pi}{4}} 2^{\tan x}$

Question #16

Reference Q.202

Evaluate $\lim_{x \rightarrow 0^+} 10^{\frac{10}{x}}$

Question #17

Reference Q.203

Evaluate $\lim_{x \rightarrow \infty} \frac{x^7}{\cos x}$

Question #18

Reference Q.204

Evaluate this limit: $\lim_{x \rightarrow +\infty} \frac{2^x - 2^{-x} + 2}{2^x + 2^{-x} + 2}$

Question #23

Reference Q.3210

Evaluate $\lim_{x \rightarrow \infty} \frac{(ax^3 + bx^2)(cx^2 + dx) + bx^5}{px + qx^5 + rx^4}$

Question #24

Reference Q.9133

Evaluate $\lim_{x \rightarrow \infty} \frac{x^k}{3^x}$, where k is a (fixed) real number. Does the value of k affect the answer?

Question #19

Reference Q.205

Evaluate the limit: $\lim_{x \rightarrow +\infty} \sin \frac{1}{x}$

Question #20

Reference Q.206

Evaluate $\lim_{x \rightarrow +\infty} \frac{e^{x^2}}{e^x}$.

Question #21

Reference Q.207

(Higher Level - Try this!) Consider the function $f(x) = x^n$, where $n \geq 0$. Describe what happens to the limit of the function as $x \rightarrow +\infty$ and $x \rightarrow -\infty$. Hint: Keep in mind how n might affect this.

Question #22

Reference Q.3209

Sketch a function with the following properties:

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

Question #25

Reference Q.9134

Evaluate $\lim_{x \rightarrow \infty} \frac{x^7 + (\cos x)^x}{2^x}$

Question #26

Reference Q.9153

Evaluate the following limit:

$\lim_{x \rightarrow \infty} (4 + 2^x)^{\frac{1}{x}}$