

# WolframAlpha<sup>®</sup> computational knowledge engine.

Enter what you want to calculate or know about:



 Web Apps  Examples  Random

Explore some of the things Wolfram|Alpha can do:

$\sin(x)$  Mathematics

 Step-by-step Solutions

 Words & Linguistics

 Units & Measures

 Statistical & Data Analysis

 People & History

 Dates & Times

 Chemistry

 Culture & Media

 Money & Finance

 Physics

 Art & Design

 Socioeconomic Data

 Astronomy

 Music

limit  $x^2+4$  as  $x \rightarrow 1$



 Web Apps  Examples  Random

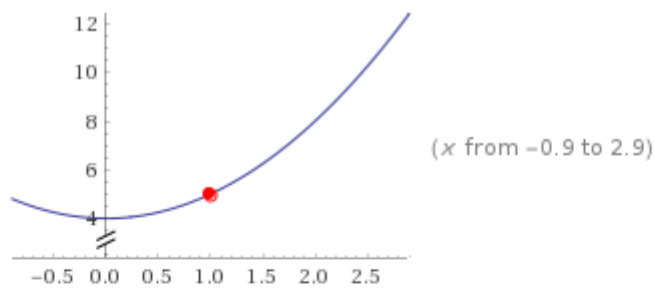
Limit:

 Step-by-step solution

$$\lim_{x \rightarrow 1} (x^2 + 4) = 5$$

Open code 

Plot:



Series expansion at  $x=1$ :

More terms

$$5 + 2(x - 1) + (x - 1)^2 + O((x - 1)^6)$$

(Taylor series)



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limit sinx/x as x->0



Web Apps Examples Random

Limit:

Step-by-step solution

$$\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = 1$$

Open code

Enlarge | Data | Customize | Plaintext | Interactive

PLOT



Series expansion at x=0:

More terms

$$1 - \frac{x^2}{6} + \frac{x^4}{120} + O(x^6)$$

(Taylor series)



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limit (x^2-4)/(x-2) as x->2



 Web Apps  Examples  Random

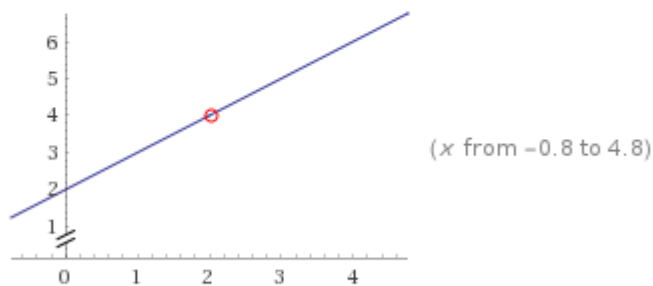
Limit:

 Step-by-step solution

$$\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} = 4$$

Open code 

Plot:



Series expansion at x=2:

$$x + 2$$



limit abs(x)/x as x->0



Web Apps Examples Random

Input:

$$\lim_{x \rightarrow 0} \frac{|x|}{x}$$

Open code

$|z|$  is the absolute value of  $z$

Limit:

(two-sided limit does not exist)

Limit from the left:

Step-by-step solution

$$\lim_{x \rightarrow 0^-} \frac{|x|}{x} = -1$$



Limit from the right:

Step-by-step solution

$$\lim_{x \rightarrow 0^+} \frac{|x|}{x} = 1$$



Plot:

