

Fundamentos de Cálculo Aplicado

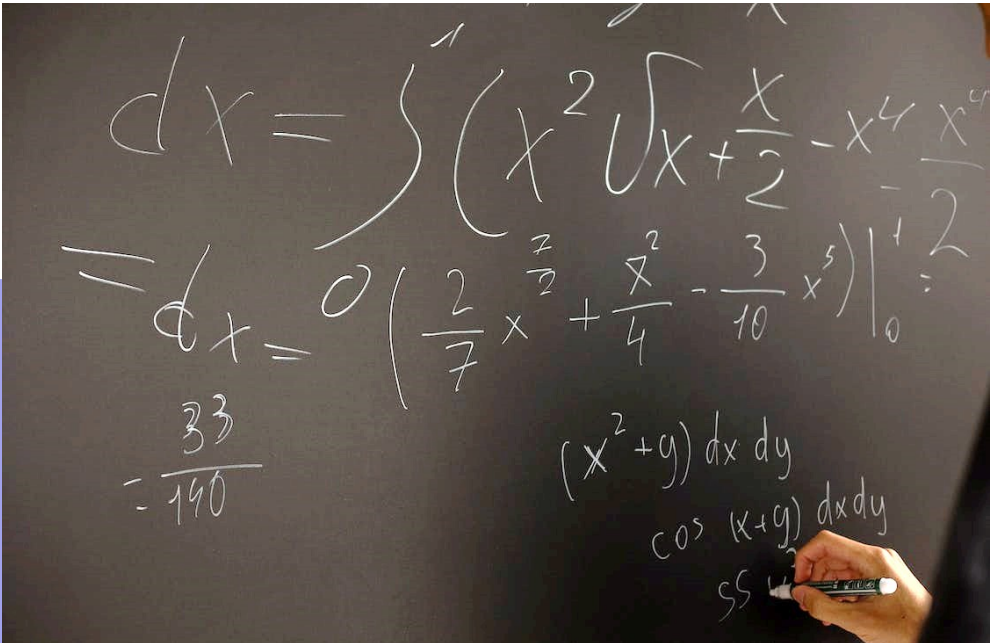
Fundamentos gerais sobre
limites e derivadas

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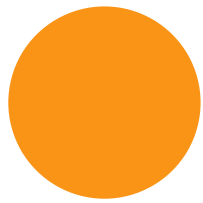


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Limites infinitos e no infinito



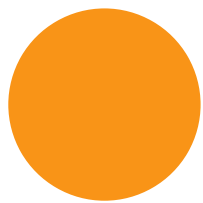
The image shows a chalkboard with handwritten mathematical work. The main equation is an integral:
$$\int_0^1 \left(x^2 \sqrt{x} + \frac{x}{2} - x^4 \frac{x^4}{2} \right) dx$$
 Below this, the integral is evaluated:
$$= \left(\frac{2}{7} x^{\frac{7}{2}} + \frac{x^2}{4} - \frac{3}{10} x^{\frac{9}{2}} \right) \Big|_0^1 = \frac{33}{140}$$
 To the right, there are two more expressions:
$$(x^2 + y) dx dy$$
 and
$$\cos(x+y) dx dy$$
 A hand is visible at the bottom right, holding a piece of chalk.



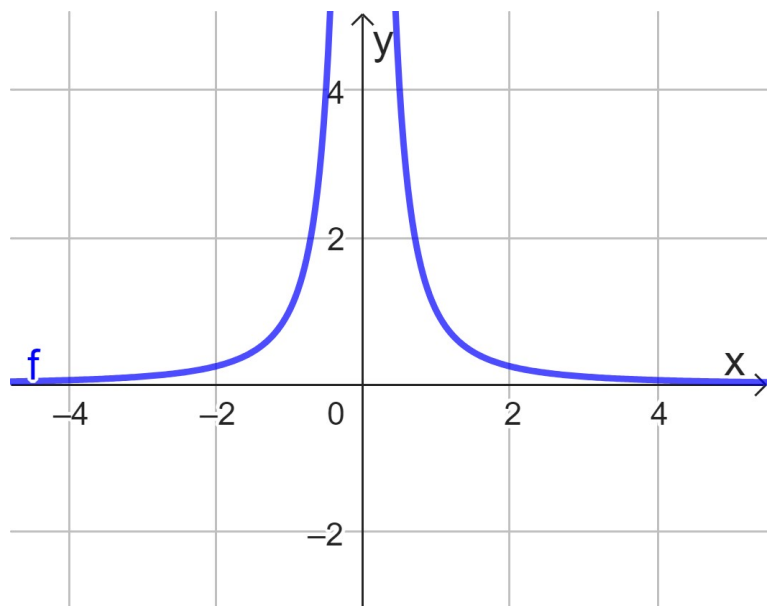
Limites infinitos

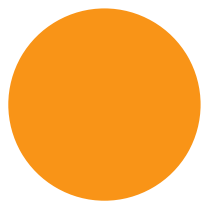
Às vezes, os limites laterais ou bilaterais não existem porque os valores da função crescem ou decrescem sem cotas. Esses comportamentos de limites são descritos escrevendo:



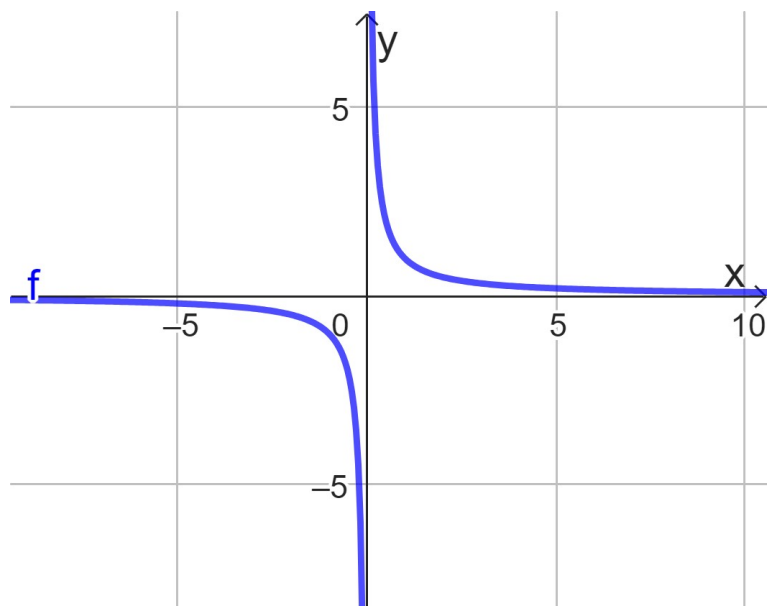


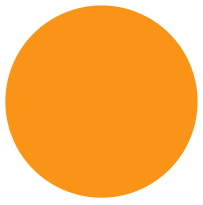
Exemplo:





Exemplo:

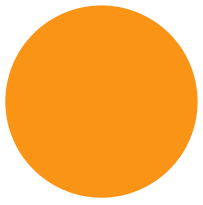




Assíntota vertical

A reta é chamada **assíntota vertical** da curva se pelo menos uma das seguintes condições for satisfeita:



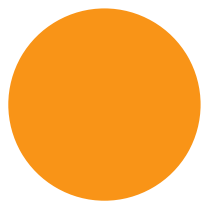


Limites no infinito

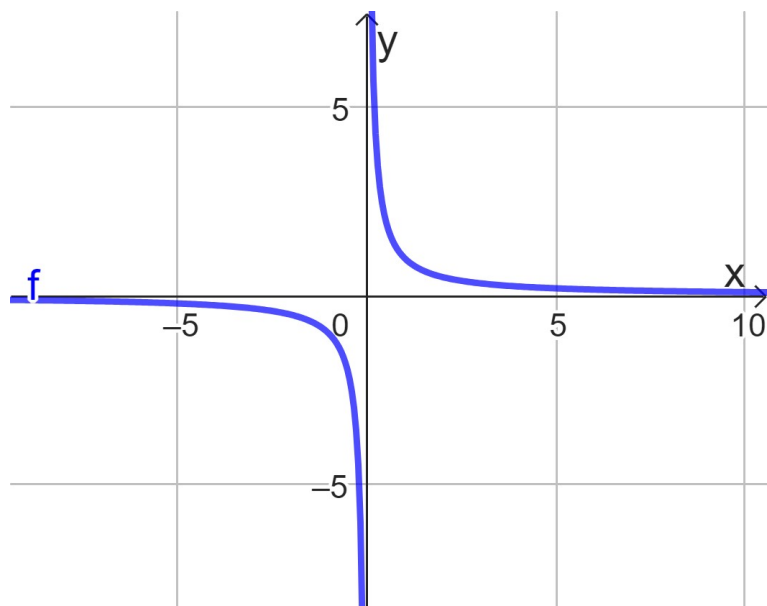
Se os valores de $f(x)$ ficam tão próximos quanto queiramos de um número L à medida que x cresce sem cota, então escrevemos:

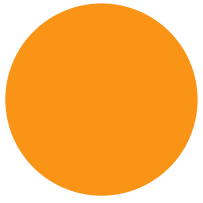
De modo análogo, para $f(x)$ decrescendo sem cota temos:





Exemplo:





Assíntota horizontal

Se ocorre ou temos que é uma assíntota horizontal para o gráfico de .

