

# Fundamentos de Cálculo Aplicado

Fundamentos gerais sobre  
cálculo diferencial e  
integral

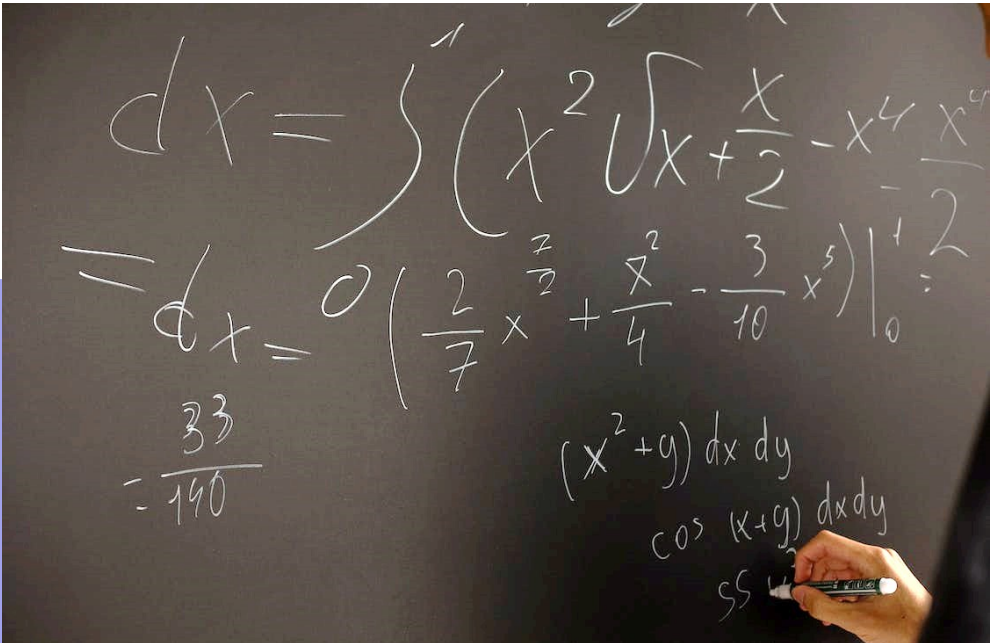
Profa. Ma. Alessandra Negrini



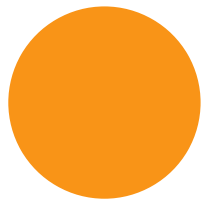
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# Introdução às integrais

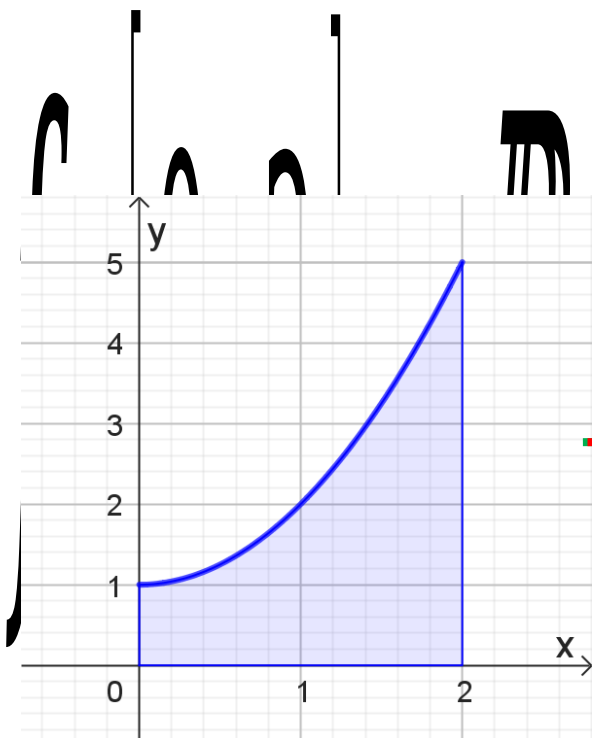
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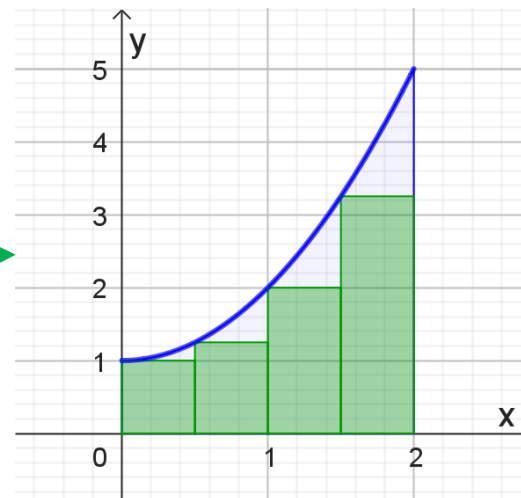
The image shows a chalkboard with handwritten mathematical work. The top part shows an integral calculation: 
$$dx = \int \left( x^2 \sqrt{x} + \frac{x}{2} - x^4 \frac{x^4}{2} \right) dx$$
$$= \int \left( \frac{2}{7} x^{\frac{7}{2}} + \frac{x^2}{4} - \frac{3}{10} x^5 \right) dx$$
$$= \frac{33}{140}$$
 Below this, there are two more expressions: 
$$(x^2 + y) dx dy$$
$$\cos(x+y) dx dy$$
 A hand is visible at the bottom right, holding a piece of chalk.



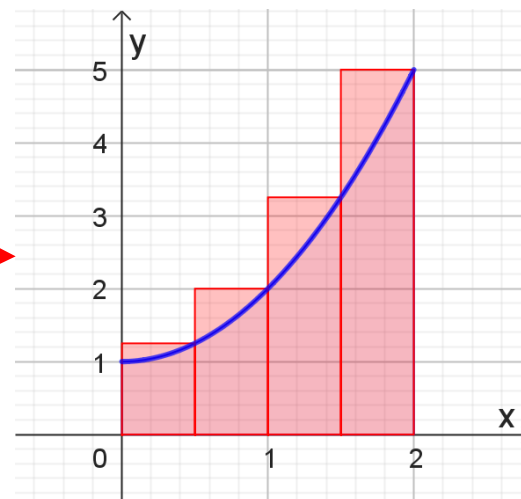
# Soma de Riemann e integrais definidas

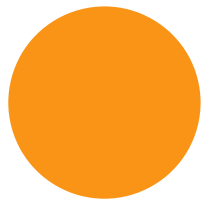


Soma inferior



Soma superior

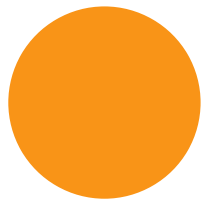




# Integrais definidas

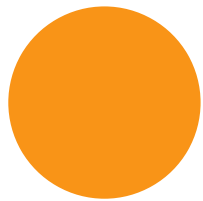
Se  $f$  é uma função contínua definida em  $[a, b]$  então a integral definida de  $f$  de  $a$  a  $b$  é





# Propriedades





# Teorema Fundamental do Cálculo

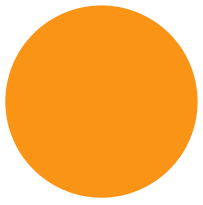
**Parte 1:** Para  $f$  contínua em  $[a, b]$ , então  $f$  é contínua em  $[a, b]$ , derivável em  $(a, b)$  e tal que

**Parte 2:** É válido que

em que  $F$  é qualquer primitiva de  $f$ .

Primitiva de :  
função tal que



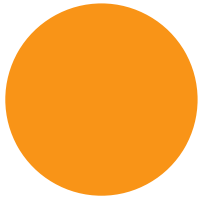


# Antiderivadas ou primitivas

Uma função  $F$  é uma antiderivada ou primitiva de uma função  $f$  em um dado intervalo se  $F'(x) = f(x)$  para todo  $x$  nesse intervalo. Logo,

Exemplo:

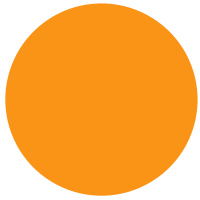




Exemplo:

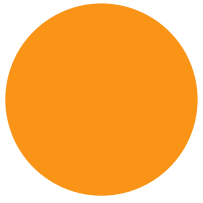






# Resultados importantes



Exemplo:

