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ANGRAMAS

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ANGRAMAS

In[2]:= Exp[x]

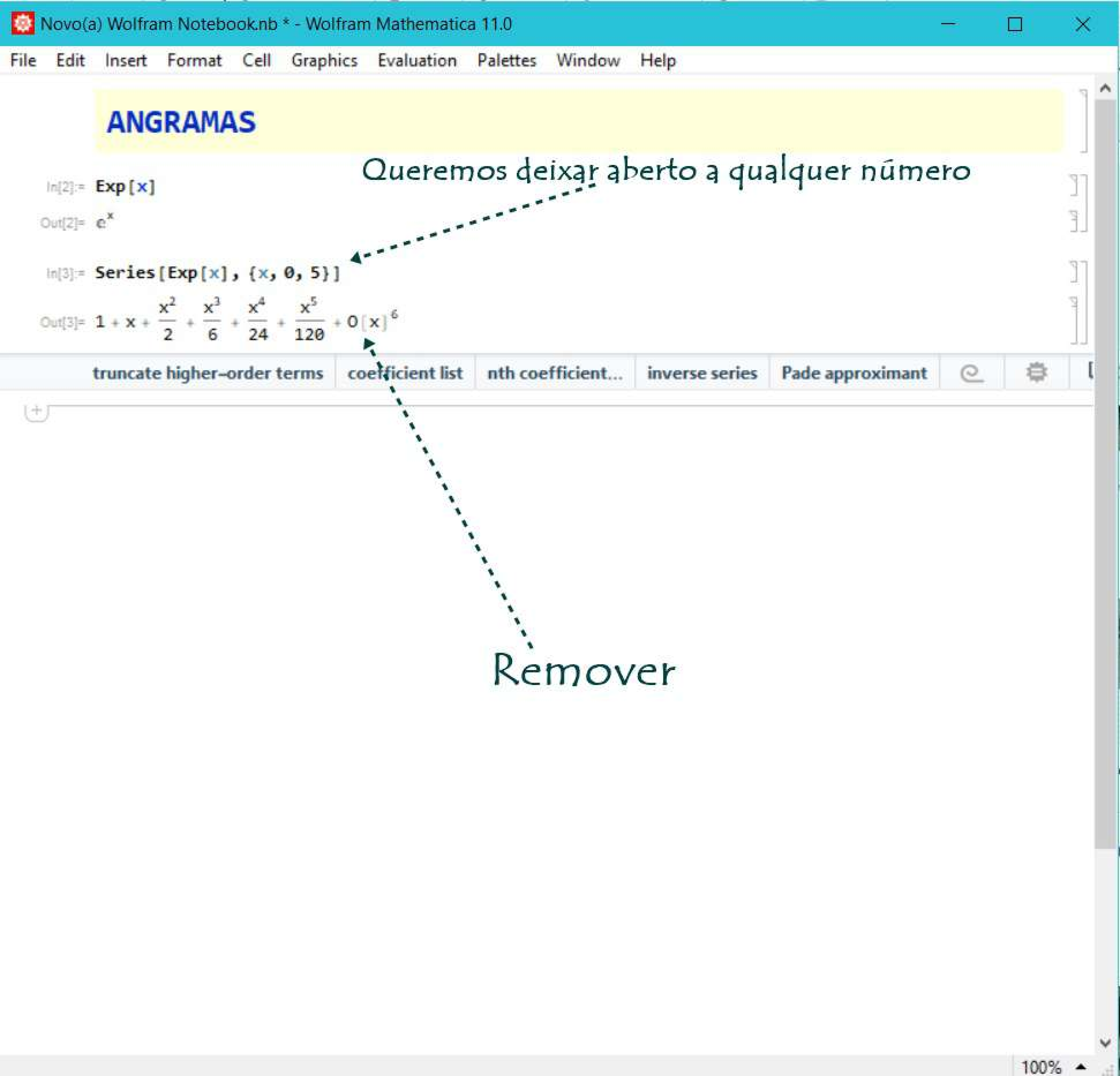
Out[2]= e^x

In[3]:= Series[Exp[x], {x, 0, 5}]

Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$

truncate higher-order terms | coefficient list | nth coefficient... | inverse series | Pade approximant

100%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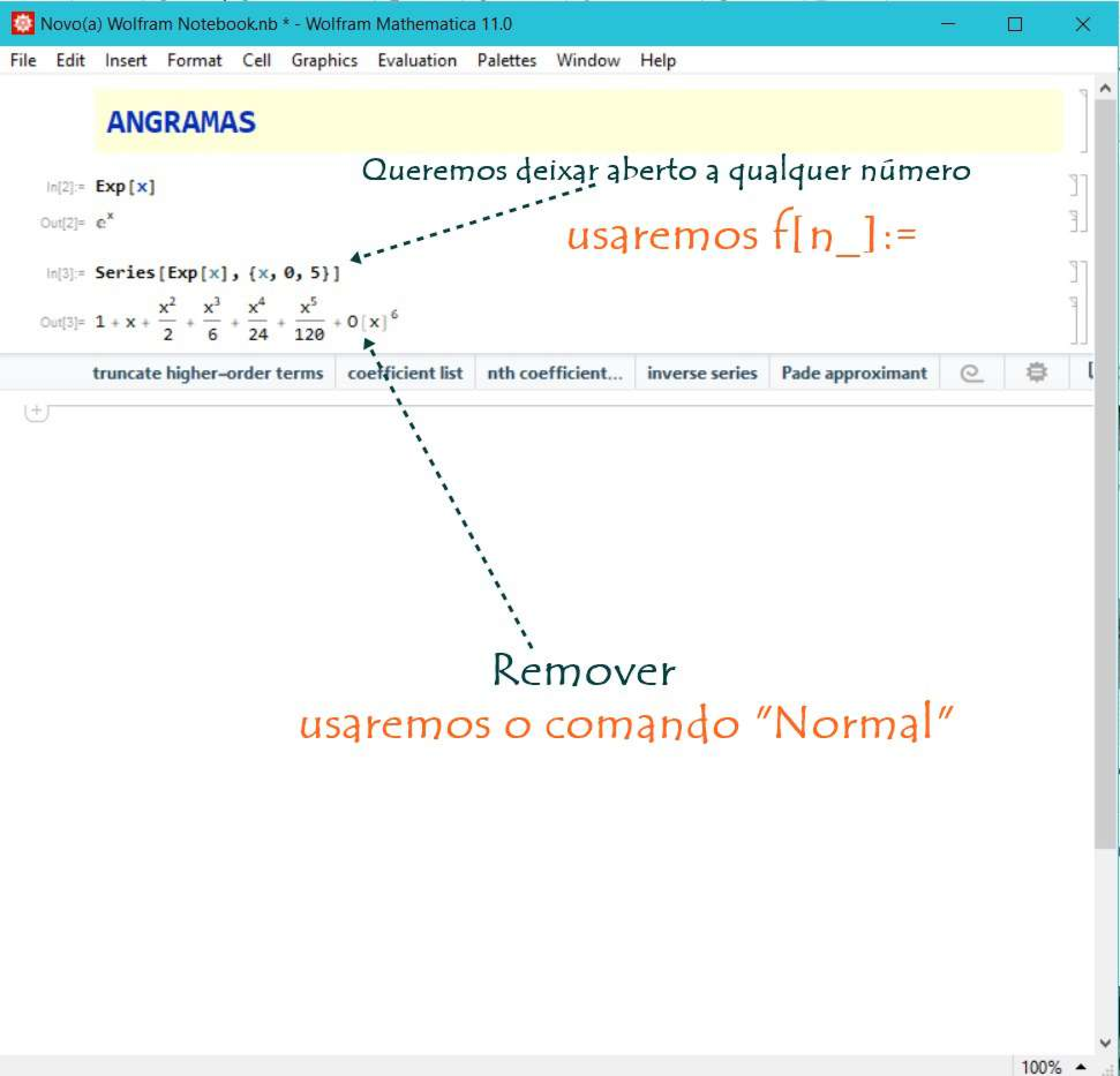
ANGRAMAS
Queremos deixar aberto a qualquer número
In[2]:= Exp[x]
Out[2]= e^x
In[3]:= Series[Exp[x], {x, 0, 5}]
Out[3]= 1 + x + x^2/2 + x^3/6 + x^4/24 + x^5/120 + O[x]^6
truncate higher-order terms
coefficient list
nth coefficient...
inverse series
Pade approximant
Remover
100%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ANGRAMAS
Queremos deixar aberto a qualquer número
usaremos f[n_]:=
In[2]:= Exp[x]
Out[2]= e^x
In[3]:= Series[Exp[x], {x, 0, 5}]
Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$
truncate higher-order terms
coefficient list
nth coefficient...
inverse series
Pade approximant
Remover
usaremos o comando "Normal"
100%

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ANGRAMAS

```
In[2]:= Exp[x]
```

Out[2]= e^x

```
In[3]:= Series[Exp[x], {x, 0, 5}]
```

Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$

```
In[4]:= Normal[Series[Exp[x], {x, 0, 5}]]
```

Out[4]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

```
In[5]:= f[n_] := Normal[Series[Exp[x], {x, 0, n}]]
```

```
In[6]:= f[5]
```

Out[6]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

```
In[7]:= f[6]
```

Out[7]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + \frac{x^6}{720}$

100%

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ANGRAMAS

```
In[2]:= Exp[x]
```

Out[2]= e^x

```
In[3]:= Series[Exp[x], {x, 0, 5}]
```

Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$

```
In[4]:= Normal[Series[Exp[x], {x, 0, 5}]]
```

Out[4]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

```
In[5]:= f[n_] := Normal[Series[Exp[x], {x, 0, n}]]
```

```
In[6]:= f[5]
```

Out[6]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

```
In[7]:= f[6]
```

Out[7]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + \frac{x^6}{720}$

Como fazer se o exercício requer a presença de pelo uma ou mais letras?

Teremos que eliminar os primeiros termos

100%

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ANGRAMAS

```
In[2]:= Exp[x]
```

Out[2]= e^x

```
In[3]:= Series[Exp[x], {x, 0, 5}]
```

Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$

```
In[4]:= Normal[Series[Exp[x], {x, 0, 5}]]
```

Out[4]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

```
In[5]:= f[n_] := Normal[Series[Exp[x], {x, 0, n}]]
```

```
In[6]:= f[5]
```

Out[6]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

```
In[7]:= f[6]
```

Out[7]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + \frac{x^6}{720}$

Introduziremos uma função g[n] que irá até a ordem que precisamos eliminar

100%

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In[2]:= `Exp[x]`

Out[2]= e^x

In[3]:= `Series[Exp[x], {x, 0, 5}]`

Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$

In[4]:= `Normal[Series[Exp[x], {x, 0, 5}]]`

Out[4]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

In[5]:= `f[n_] := Normal[Series[Exp[x], {x, 0, n}]]`

In[6]:= `f[5]`

Out[6]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

In[7]:= `f[6]`

Out[7]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + \frac{x^6}{720}$

In[14]:= `g[m_] := Normal[Series[Exp[x], {x, 0, m - 1}]]`

In[15]:= `L[n_, m_] := f[n] - g[m]`

100%

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ANGRAMAS

In[2]:= `Exp[x]`

Out[2]= e^x

In[3]:= `Series[Exp[x], {x, 0, 5}]`

Out[3]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + O[x]^6$

In[4]:= `Normal[Series[Exp[x], {x, 0, 5}]]`

Out[4]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

In[5]:= `f[n_] := Normal[Series[Exp[x], {x, 0, n}]]`

In[6]:= `f[5]`

Out[6]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120}$

In[7]:= `f[6]`

Out[7]= $1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \frac{x^4}{24} + \frac{x^5}{120} + \frac{x^6}{720}$

In[9]:= `g[m_] := Normal[Series[Exp[x], {x, 0, m - 1}]]`

In[10]:= `L[n_, m_] := f[n] - g[m]`

L[3,1]

L[3,1]

L[2,0]

L[2,0]

100%

Exemplo do teste B .... {3A,3B,2C,2D}
com pelo menos uma A e uma B

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

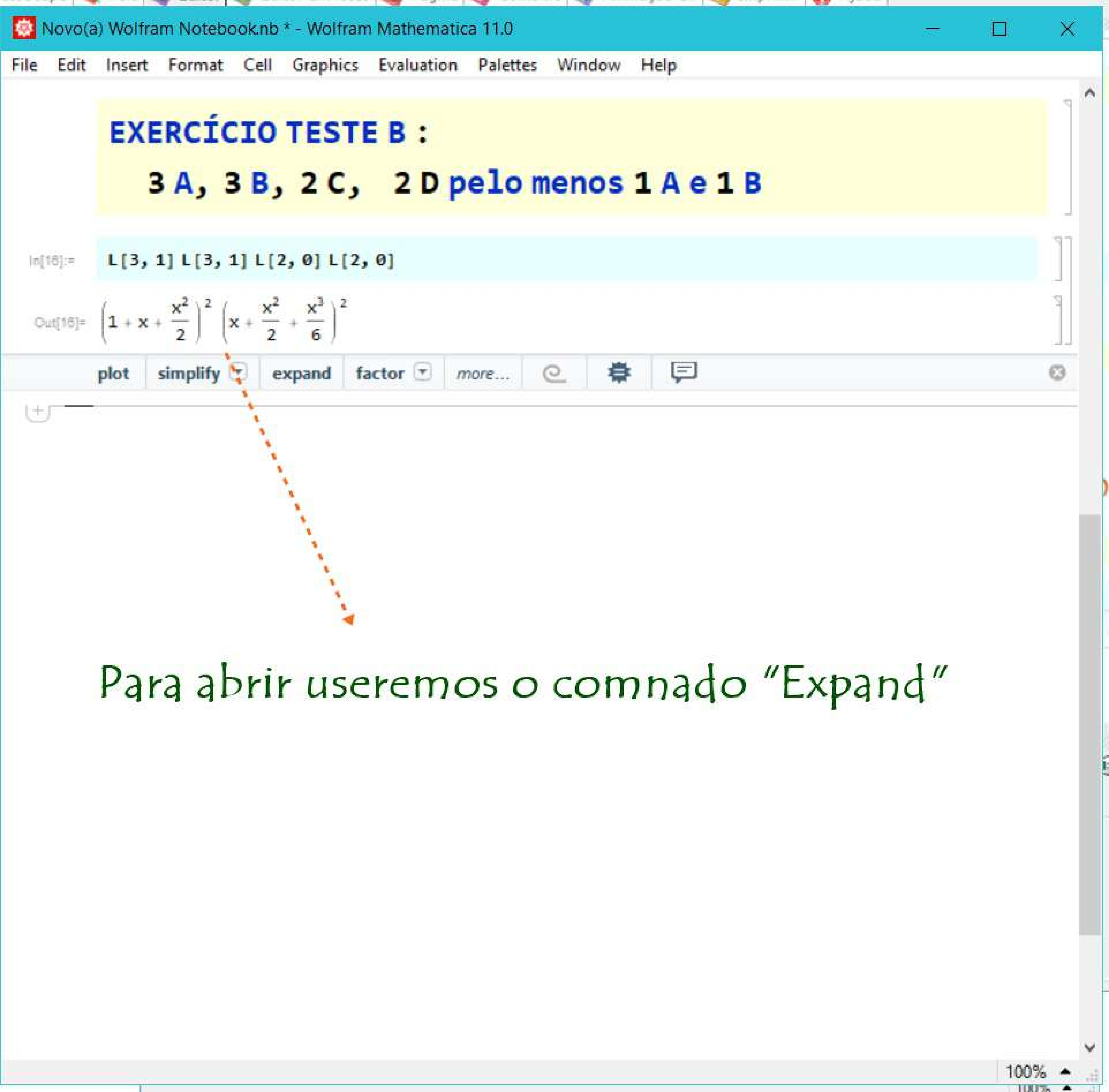
In[16]:=

```
L[3, 1] L[3, 1] L[2, 0] L[2, 0]
```

Out[16]= $\left(1+x+\frac{x^2}{2}\right)^2 \left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)^2$

plot simplify expand factor more...

100%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EXERCÍCIO TESTE B :
3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B
In[16]:= L[3, 1] L[3, 1] L[2, 0] L[2, 0]
Out[16]= (1 + x + x^2/2)^2 (x + x^2/2 + x^3/6)^2
plot simplify expand factor more...
Para abrir useremos o comnado "Expand"
100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:= L[3, 1] L[3, 1] L[2, 0] L[2, 0]

Out[16]= $\left(1+x+\frac{x^2}{2}\right)^2\left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)^2$

In[18]:= Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]]

Out[18]= $x^2+3x^3+\frac{55x^4}{12}+\frac{13x^5}{3}+\frac{25x^6}{9}+\frac{11x^7}{9}+\frac{53x^8}{144}+\frac{5x^9}{72}+\frac{x^{10}}{144}$

plot simplify factor x derivative more...

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:=
```
L[3, 1] L[3, 1] L[2, 0] L[2, 0]
```

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plot simplify factor x derivative more...

Agora queremos pegar por exemplo o coeficiente da potência x ^ 4 e multiplicar para 4!

Como podemos fazer isso de forma rápida?

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:= `L[3, 1] L[3, 1] L[2, 0] L[2, 0]`

Out[16]= $\left(1+x+\frac{x^2}{2}\right)^2\left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)^2$

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plot | simplify | factor | x derivative | more...

Agora queremos pegar por exemplo o coeficiente da potência x ^ 4 e multiplicar para 4!

UASREMOS A DERIVADA DE ORDEM 4 !!! O PRIMEIRO TERMOS SERÀ EXATAMENTE O QUE ESTAMOS PROCURANDO

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:=
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In[19]:=
```
D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}]
```

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

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```

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

como eliminar estes termos? .... simples
limite com x que tende a zero!!!!

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:=
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L[3, 1] L[3, 1] L[2, 0] L[2, 0]
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In[19]:=
```
D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}]
```

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

In[20]:=
```
Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}]
```

Out[20]= {110}

numerical values

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:=
```
L[3, 1] L[3, 1] L[2, 0] L[2, 0]
```

Out[16]= $\left(1+x+\frac{x^2}{2}\right)^2\left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)^2$

In[18]:=
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Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]]
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In[20]:=
```
Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}]
```

Out[20]= {110}

numerical values

melhoramos o programa para poder lembrar que 110 representa o número de anagramas de 4 letras

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:=
```
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In[19]:=
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```

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

```
Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}]
```

Out[20]= {110}

In[22]:=
```
{4, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}][[1]]}
```

Out[22]= {4, 110}

total gcd mean max more...

este comando permite de pegar de {110} o número

100%

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EXERCÍCIO TESTE B :

3 A, 3 B, 2 C, 2 D pelo menos 1 A e 1 B

In[16]:=
```
L[3, 1] L[3, 1] L[2, 0] L[2, 0]
```

Out[16]= $\left(1+x+\frac{x^2}{2}\right)^2\left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)^2$

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```
Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]]
```

Out[18]= $x^2+3x^3+\frac{55x^4}{12}+\frac{13x^5}{3}+\frac{25x^6}{9}+\frac{11x^7}{9}+\frac{53x^8}{144}+\frac{5x^9}{72}+\frac{x^{10}}{144}$

In[19]:=
```
D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}]
```

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

```
Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}]
```

Out[20]= {110}

AGORA QUEREMOS ALGO GERAL

In[22]:=
```
{4, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}][[1]]}
```

Out[22]= {4, 110}

total gcd mean max more...

100%

este comando permite de pegar de {110} o número

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Out[16]= $\left(1+x+\frac{x^2}{2}\right)\left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)$

In[18]:= `Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]]`

Out[18]= $x^2+3x^3+\frac{55x^4}{12}+\frac{13x^5}{3}+\frac{25x^6}{9}+\frac{11x^7}{9}+\frac{53x^8}{144}+\frac{5x^9}{72}+\frac{x^{10}}{144}$

In[19]:= `D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}]`

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

`Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}]`

Out[20]= {110}

In[22]:= `{4, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}][[1]]}`

Out[22]= {4, 110}

In[23]:= `Ana[num_] := {num, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, num}], {x → 0}][[1]]}`

In[24]:= `Ana[4]`

Out[24]= {4, 110}

In[25]:= `Ana[6]`

Out[25]= {6, 2000}

In[26]:= `Ana[10]`

Out[26]= {10, 25 200}

total gcd mean max more...

100%

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Out[16]= $\left(1+x+\frac{x^2}{2}\right)\left(x+\frac{x^2}{2}+\frac{x^3}{6}\right)$

```
In[18]:= Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]]
```

Out[18]= $x^2+3x^3+\frac{55x^4}{12}+\frac{13x^5}{3}+\frac{25x^6}{9}+\frac{11x^7}{9}+\frac{53x^8}{144}+\frac{5x^9}{72}+\frac{x^{10}}{144}$

```
In[19]:= D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}]
```

Out[19]= $110+520x+1000x^2+\frac{3080x^3}{3}+\frac{1855x^4}{3}+210x^5+35x^6$

```
Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}]
```

Out[20]= {110}

```
In[22]:= {4, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}][[1]]}
```

Out[22]= {4, 110}

```
In[23]:= Ana[num_] := {num, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, num}], {x → 0}][[1]]}
```

```
In[24]:= Ana[4]
```

Out[24]= {4, 110}

```
In[25]:= Ana[6]
```

Out[25]= {6, 2000}

```
In[26]:= Ana[10]
```

Out[26]= {10, 25 200}

total gcd mean max more...

MAS PODEMOS MELHORAR AINDA MAIS

100%

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```
In[22]:= {4, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}][[1]]}

Out[22]= {4, 110}

In[23]:= Ana[num_] := {num, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, num}], {x → 0}][[1]]}

In[24]:= Ana[4]

Out[24]= {4, 110}

In[25]:= Ana[6]

Out[25]= {6, 2000}

In[26]:= Ana[10]

Out[26]= {10, 25 200}

In[29]:= Anagramas[conjunto_, min_, max_] :=
  Table[{num, Limit[D[Expand[conjunto], {x, num}], {x → 0}][[1]]}, {num, min, max}]

In[30]:= letras := L[3, 1] L[3, 1] L[2, 0] L[2, 0]
Anagramas[letras, 2, 10]

Out[31]= {{2, 2}, {3, 18}, {4, 110}, {5, 520}, {6, 2000}, {7, 6160}, {8, 14 840}, {9, 25 200}, {10, 25 200}}
```

Assuming a tally | Use as *a matrix* or *a generic list of pairs* instead

tally barchart | sort by count | most frequent elements | transpose | extract first elements

100%

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```
In[22]:= {4, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, 4}], {x → 0}][[1]]}

Out[22]= {4, 110}

In[23]:= Ana[num_] := {num, Limit[D[Expand[L[3, 1] L[3, 1] L[2, 0] L[2, 0]], {x, num}], {x → 0}][[1]]}

In[24]:= Ana[4]

Out[24]= {4, 110}

In[25]:= Ana[6]

Out[25]= {6, 2000}

In[26]:= Ana[10]

Out[26]= {10, 25200}

In[29]:= Anagramas[conjunto_, min_, max_] :=
          Table[{num, Limit[D[Expand[conjunto], {x, num}], {x → 0}][[1]]}, {num, min, max}]

In[30]:= letras := L[3, 1] L[3, 1] L[2, 0] L[2, 0]
         Anagramas[letras, 2, 10]

Out[31]= {{2, 2}, {3, 18}, {4, 110}, {5, 520}, {6, 2000}, {7, 6160}, {8, 14840}, {9, 25200}, {10, 25200}}
```

Assuming a tally | Use as *a matrix* or *a generic list of pairs* instead

tally barchart | sort by count | most frequent elements | transpose | extract first elements

se queremos em forma de matriz podemos usar o comando "MatrixForm"

100%

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```
In[29]:= Anagramas[conjunto_, min_, max_] :=
  Table[{num, Limit[D[Expand[conjunto], {x, num}], {x → 0}][[1]]}, {num, min, max}]

In[30]:= letras := L[3, 1] L[3, 1] L[2, 0] L[2, 0]
Anagramas[letras, 2, 10]

Out[31]= {{2, 2}, {3, 18}, {4, 110}, {5, 520}, {6, 2000}, {7, 6160}, {8, 14840}, {9, 25200}, {10, 25200}}

In[32]:= letras := L[3, 1] L[3, 1] L[2, 0] L[2, 0]
MatrixForm[Anagramas[letras, 2, 10]]
```

Out[33]//MatrixForm=

2	2
3	18
4	110
5	520
6	2000
7	6160
8	14840
9	25200
10	25200

Assuming a tally | Use as *a matrix* or *a generic list of pairs* instead

tally barchart | sort by count | most frequent elements | transpose | extract first elements

100%

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In[29]:=
```
Anagramas[conjunto_, min_, max_] :=
 Table[{num, Limit[D[Expand[conjunto], {x, num}], {x → 0}][[1]]}, {num, min, max}]
```

In[30]:=
```
letras := L[3, 1] L[3, 1] L[2, 0] L[2, 0]
Anagramas[letras, 2, 10]
```

Out[31]=
```
{{2, 2}, {3, 18}, {4, 110}, {5, 520}, {6, 2000}, {7, 6160}, {8, 14840}, {9, 25200}, {10, 25200}}
```

In[32]:=
```
letras := L[3, 1] L[3, 1] L[2, 0] L[2, 0]
MatrixForm[Anagramas[letras, 2, 10]]
```

Out[33]//MatrixForm=

2	2
3	18
4	110
5	520
6	2000
7	6160
8	14 840
9	25 200
10	25 200

Assuming a tally | Use as *a matrix* or *a generic list of pairs* instead

tally barchart | sort by count | most frequent elements | transpose | extract first elements

claramente podemos simplificar tudo e obter um mini programa

100%

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ANGRAMAS

```
L[n_, m_] := Normal[Series[Exp[x], {x, 0, n}]] - Normal[Series[Exp[x], {x, 0, m - 1}]]

AnaM[conjunto_, min_, max_] :=
 MatrixForm[Table[{num, Limit[D[Expand[conjunto], {x, num}], {x → 0}][[1]]},
   {num, min, max}]]
```

In[3]:=
```
letras = L[3, 1] L[3, 1] L[2, 0] L[2, 0]
AnaM[letras, 2, 10]
```

Out[3]= $\left(1 + x + \frac{x^2}{2}\right)^2 \left(x + \frac{x^2}{2} + \frac{x^3}{6}\right)^2$

Out[4]//MatrixForm=

2	2
3	18
4	110
5	520
6	2000
7	6160
8	14 840
9	25 200
10	25 200

Assuming a tally | Use as *a matrix* or *a generic list of pairs* instead

tally barchart | sort by count | most frequent elements | transpose | extract first elements

100%