versione 0

Equazioni differenziali – 0

In[5]:= Simplify[DSolve[{y'[x] == $\frac{-x\,y[x]}{4-x^2}$ + 6 x, y[$\sqrt{5}$] == 3},
y[x], x]]

Out[5]= $\{\{y[x] \to -3\left(8 - 2x^2 + \sqrt{-4 + x^2}\right)\}\}$

Funzioni di due variabili, punti critici – 0

In[11]:= g[x_, y_] := y^2 Log[x + y]

In[12]:= f[x_, y_] := g[x, y]; Expand[f[x, y]]

Out[12]= y^2 Log[x + y]

In[13]:= grad = Expand[{D[f[x, y], x], D[f[x, y], y]}]

Out[13]= $\left\{\frac{y^2}{x+y}, \frac{y^2}{x+y} + 2\,y\,\text{Log}[x+y]\right\}$

In[15]:= H[x_, y_] = $\begin{pmatrix} \partial_{x,x} f[x, y] & \partial_{x,y} f[x, y] \\ \partial_{y,x} f[x, y] & \partial_{y,y} f[x, y] \end{pmatrix}$;
Simplify[MatrixForm[H[x, y]]]

Out[16]//MatrixForm=
$$\begin{pmatrix} -\frac{y^2}{(x+y)^2} & \frac{y\,(2x+y)}{(x+y)^2} \\ \frac{y\,(2x+y)}{(x+y)^2} & \frac{y\,(4x+3y)}{(x+y)^2} + 2\,\text{Log}[x+y] \end{pmatrix}$$

In[17]:= Simplify[MatrixForm[H[x, 0]]]

Out[17]//MatrixForm=
$$\begin{pmatrix} 0 & 0 \\ 0 & 2\,\text{Log}[x] \end{pmatrix}$$

Integrale doppio – 0

In[20]:= $f[x\_, y\_] := \frac{e^x}{1 + y^2};$

$\text{Simplify}\left[\left\{\int_0^{\text{Tan}[x]} f[x, y]\, dy,\ \int_0^{\frac{\pi}{4}} \int_0^{\text{Tan}[x]} f[x, y]\, dy\, dx\right\}\right]$

Out[21]= $\left\{e^x\, \text{ArcTan}[\text{Tan}[x]],\ 1 + \frac{1}{4} e^{\pi/4} (-4 + \pi)\right\}$

In[23]:= $f[x\_, y\_] := \frac{e^x}{1 + y^2};$

$\text{Simplify}\left[\left\{\int_{\text{ArcTan}[y]}^{\frac{\pi}{4}} f[x, y]\, dx,\ \int_0^1 \int_{\text{ArcTan}[y]}^{\frac{\pi}{4}} f[x, y]\, dx\, dy\right\}\right]$

Out[24]= $\left\{\frac{e^{\pi/4} - e^{\text{ArcTan}[y]}}{1 + y^2},\ 1 + \frac{1}{4} e^{\pi/4} (-4 + \pi)\right\}$

Numero complesso – 0

In[27]:= $w = \frac{1}{2} + \frac{\sqrt{3}}{2} i;$

$\text{Solve}\left[\left\{w * (x - y\, i) == x + y\, i,\ x^2 + y^2 == 4\right\}, \{x, y\}\right]$

Out[28]= $\left\{\left\{x \to -\sqrt{3},\ y \to -1\right\},\ \left\{x \to \sqrt{3},\ y \to 1\right\}\right\}$

In[29]:= $\text{Solve}\left[w * e^{-i\, t} == e^{i\, t},\ t\right]$

Solve::ifun :
Inverse functions are being used by Solve, so some solutions may not be found; use Reduce for complete solution information. ≫

Out[29]= $\left\{\left\{t \to \frac{\pi}{6}\right\}\right\}$

Matrice, autovalori… – 0

In[57]:= $a = \begin{pmatrix} 2 & 2 \\ 2 & 2 \end{pmatrix};$

```
Print[Eigenvalues[a]];
Orthogonalize[Eigenvectors[a]]
```

{4, 0}

Out[59]= $\left\{\left\{\frac{1}{\sqrt{2}},\ \frac{1}{\sqrt{2}}\right\},\ \left\{-\frac{1}{\sqrt{2}},\ \frac{1}{\sqrt{2}}\right\}\right\}$