versione 0

Equazioni differenziali – 0

```
DSolve[{y'[x] == (6 x y[x])/(x^2 - 4) + 8 x, y[Sqrt[3]] == 5},
 y[x], x]
```

$\{\{y[x] \to 200 - 146\, x^2 + 36\, x^4 - 3\, x^6\}\}$

```
Factor[%]
```

$\{\{y[x] \to -(-2 + x)\, (2 + x)\, (50 - 24\, x^2 + 3\, x^4)\}\}$

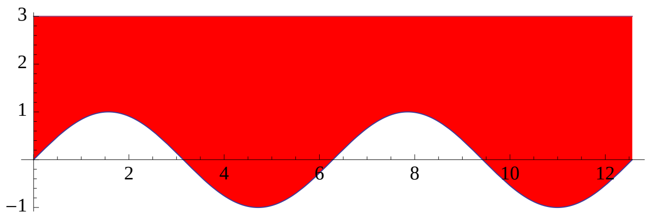
```
Expand[3 (4 - x^2)^3 + 2 (4 - x^2)]
```

$200 - 146\, x^2 + 36\, x^4 - 3\, x^6$

Funzioni di due variabili, punti critici – 0

```
f[x_, y_] := (x - 11)^2 + (y - 2)^2
```

```
Plot[{Sin[x], 3}, {x, 0, 4 Pi}, Filling → {1 → {{2}, Red}},
 AspectRatio → Automatic]
```



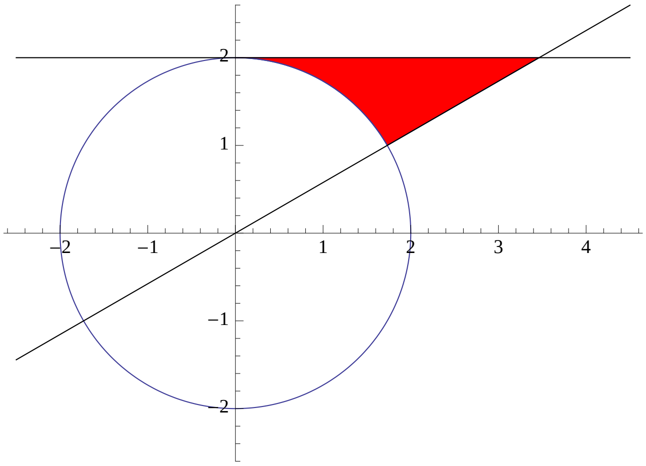

```
f[0, 0]
```

125

Integrale doppio – 0

```
f[x_] := If[-2 < x < Sqrt[3], Sqrt[4 - x^2], x/Sqrt[3]]
```

```
aa = Plot[{f[x], 2}, {x, 0, 2 √3},
   Filling → {1 → {{2}, Red}}, AspectRatio → Automatic,
   Axes -> False];
ab = ParametricPlot[{2 Cos[t], 2 Sin[t]}, {t, 0, 2 Pi}];
ba = Plot[{x/√3, 2}, {x, -2.5, 4.5},
   PlotStyle → {{Black}}];
Show[az, ba, Axes → True, AxesOrigin → {0, 0}]
```




```
f[x_, y_] := y
```

$$\text{Print}\left[\int_2^{\frac{2}{\text{Sin[t]}}} r\, f[r\,\text{Cos[t]}, r\,\text{Sin[t]}]\, dr\right];$$

$$\text{Print}\left[\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \int_2^{\frac{2}{\text{Sin[t]}}} r\, f[r\,\text{Cos[t]}, r\,\text{Sin[t]}]\, dr\, dt\right]$$

$$\frac{8\,\text{Csc}[t]^2}{3} - \frac{8\,\text{Sin}[t]}{3}$$

$$\frac{4}{\sqrt{3}}$$

$$\text{Print}\left[\int_{\sqrt{4-y^2}}^{\sqrt{3}\,y} f[x, y]\, dx\right];$$

$$\text{Print}\left[\int_1^2 \int_{\sqrt{4-y^2}}^{\sqrt{3}\,y} f[x, y]\, dx\, dy\right]$$

$$y\left(\sqrt{3}\,y - \sqrt{4-y^2}\right)$$

$$\frac{4}{\sqrt{3}}$$

$$\text{Print}\left[\left\{\int_{\sqrt{4-x^2}}^{2} f[x,y]\, dy,\ \int_{\frac{x}{\sqrt{3}}}^{2} f[x,y]\, dy\right\}\right];$$

$$\text{Print}\left[\left\{\int_0^{\sqrt{3}}\int_{\sqrt{4-x^2}}^{2} f[x,y]\, dy\, dx,\ \int_{\sqrt{3}}^{2\sqrt{3}}\int_{\frac{x}{\sqrt{3}}}^{2} f[x,y]\, dy\, dx\right\}\right];$$

$$\text{Print}\left[\text{Together}\left[\int_0^{\sqrt{3}}\int_{\sqrt{4-x^2}}^{2} f[x,y]\, dy\, dx + \int_{\sqrt{3}}^{2\sqrt{3}}\int_{\frac{x}{\sqrt{3}}}^{2} f[x,y]\, dy\, dx\right]\right]$$

$$\left\{\frac{x^2}{2},\ 2-\frac{x^2}{6}\right\}$$

$$\left\{\frac{\sqrt{3}}{2},\ \frac{5}{2\sqrt{3}}\right\}$$

$$\frac{4}{\sqrt{3}}$$

Numeri complessi – 0

In[2]:= $w = e^{\frac{\pi}{3} i} + 1;$ Print[{Re[w], Im[w], Abs[w], Arg[w]}]

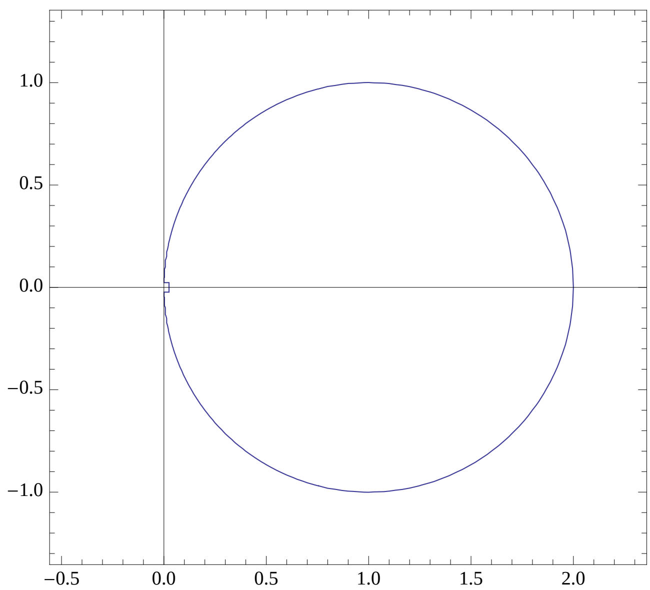
$$\left\{\frac{3}{2},\ \frac{\sqrt{3}}{2},\ \sqrt{3},\ \frac{\pi}{6}\right\}$$

In[5]:= $\text{Print}\left[\left\{\text{Re}\left[\frac{1}{w}\right],\ \text{Im}\left[\frac{1}{w}\right]\right\}\right]$

$$\left\{\frac{1}{2},\ -\frac{1}{2\sqrt{3}}\right\}$$

In[11]:= $\text{ContourPlot}\left[\frac{x}{x^2+y^2} == \frac{1}{2},\ \{x, -.5, 2.3\},\ \{y, -1.3, 1.3\},\ \text{Axes} \to \text{True},\ \text{AspectRatio} \to \text{Automatic}\right]$

Out[11]=



Matrici, autovalori – 0

In[16]:= **a = $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$; Print[Eigenvalues[a]]; Orthogonalize[Eigenvectors[a]]**

{-1, 1}

Out[16]= $\left\{\left\{-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right\}, \left\{\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right\}\right\}$

In[17]:= **p = $\left\{\left\{\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right\}, \left\{-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right\}\right\}$; MatrixForm[p]**

$$\begin{pmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \end{pmatrix}$$

In[20]:= **MatrixForm[Transpose[p].a.p]**

Out[20]//MatrixForm=

$$\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$