versione 0

Equazioni differenziali – 0

```
TrigReduce[DSolve[{5 y''[x] + 2 y'[x] + y[x] == 4 e^-x/5, y[0] == 6, y'[0] == 2},
  y[x], x]]
```

$$\left\{\left\{y[x] \to e^{-x/5} \left(5 + \cos\left[\frac{2x}{5}\right] + 8\sin\left[\frac{2x}{5}\right]\right)\right\}\right\}$$

Funzioni di due variabili, punti critici – 0

```
Minimo, massimo di f (x, y) = x^2 + y^2 - 4 x
in A = {(x, y); 1 ≤ y ≤ 1 + x^3, x ≤ 3}
assai facile con linee di livello (circonferenze)
```

```
f[x_, y_] := x^2 + y^2 - 4 x;
{f[2, 1], f[3, 28]}
```

{-3, 781}

Integrale doppio – 0

```
f[x_, y_] := x^3 / (y^3 + 2);
```

$$\text{Simplify}\left[\left\{\int_{\sqrt{\frac{1}{2}y}}^{\sqrt{y}} f[x, y] \, dx,\right.\right.$$

$$\left.\left.\int_0^1 \int_{\sqrt{\frac{1}{2}y}}^{\sqrt{y}} f[x, y] \, dx \, dy\right\}\right]$$

$$\left\{\frac{3 y^2}{16 \left(2 + y^3\right)}, \frac{1}{16} \log\left[\frac{3}{2}\right]\right\}$$

Numeri complessi – 0

```
Solve[z^6 == -64, z]
```

$$\{\{z \to -2 \, i\}, \{z \to 2 \, i\}, \{z \to -2 \, (-1)^{1/6}\}, \{z \to 2 \, (-1)^{1/6}\}, \{z \to -2 \, (-1)^{5/6}\}, \{z \to 2 \, (-1)^{5/6}\}\}$$

$$\text{Print}\left[\text{Table}\left[\text{Expand}\left[2 \left(\cos\left[\frac{\pi + 2 \, k \, \pi}{6}\right] + i \sin\left[\frac{\pi + 2 \, k \, \pi}{6}\right]\right)\right], \{k, 0, 5\}\right]\right]$$

$$\left\{i + \sqrt{3}, \, 2 \, i, \, i - \sqrt{3}, \, -i - \sqrt{3}, \, -2 \, i, \, -i + \sqrt{3}\right\}$$

Matrici, autovalori – 0

```
a[k_, h_] := ( 7  k
               4  h ); Print[MatrixForm[a[k, h]]];
v = {{1}, {1}}; Print[MatrixForm[v]];
Print[MatrixForm[a[k, h].v]];
Solve[a[k, h].v == 3 v, {h, k}]
```

$$\begin{pmatrix} 7 & k \\ 4 & h \end{pmatrix}$$

$$\begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$\begin{pmatrix} 7 + k \\ 4 + h \end{pmatrix}$$

$$\{\{k \rightarrow -4, h \rightarrow -1\}\}$$

```
aa = a[-4, -1]; Print[MatrixForm[aa]];
Print[Eigenvalues[aa]];
Print[Eigenvectors[aa]];
b = Inverse[aa]; Print[MatrixForm[b]];
Print[MatrixForm[aa.b]]
```

$$\begin{pmatrix} 7 & -4 \\ 4 & -1 \end{pmatrix}$$

$$\{3, 3\}$$

$$\{\{1, 1\}, \{0, 0\}\}$$

$$\begin{pmatrix} -\frac{1}{9} & \frac{4}{9} \\ -\frac{4}{9} & \frac{7}{9} \end{pmatrix}$$

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