versione 0

Equazioni differenziali – 0

```
DSolve[{y''[x] + 2 y'[x] == 12 x * e^(-2 x), y[0] == 0, y'[0] == 5},
 y[x], x]
```

$$\{\{y[x] \to e^{-2x}\left(-4 + 4\,e^{2x} - 3x - 3x^2\right)\}\}$$

Funzioni di due variabili, punti critici – 0

```
f[x_, y_] := y - 8/x;

g1[y_] := f[6/y, y];

Print["g1(y)=f(6/y,y)="];
Print[g1[y]];
Print["g2(x)=f(x,8-2x)="];
g2[x_] := f[x, 8 - 2 x]; Print[g2[x]];
Print["g2'(x)="]
Print[g2'[x]]
Solve[g2'[x] == 0, x];
Print[{g2[1], g2[2], g2[6]}]
```

$$g1(y)=f\left(\frac{6}{y},y\right)=$$

$$-\frac{y}{3}$$

$$g2(x)=f(x,8-2x)=$$

$$8-\frac{8}{x}-2x$$

$$g2'(x)=$$

$$-2+\frac{8}{x^2}$$

$$\left\{-2,\ 0,\ -\frac{16}{3}\right\}$$

```
aa = Plot[{6 / x, 8 - 2 x}, {x, .3, 7},
    AspectRatio → Automatic];
figura[1, -.5, 7.2, -.3, 7.3, aa]
```

Integrale doppio – 0

```
f[x_, y_] := x * y^3;
Simplify[{∫_(6/y)^(4-y/2) f[x, y] dx,
  ∫_2^6 ∫_(6/y)^(4-y/2) f[x, y] dx dy}]
```

$$\left\{-18\,y+8\,y^3-2\,y^4+\frac{y^5}{8},\ \frac{2176}{15}\right\}$$

```
Simplify[{∫_(6/x)^(8-2x) f[x, y] dy,
  ∫_1^3 ∫_(6/x)^(8-2x) f[x, y] dy dx}]
```

$$\left\{4\left((-4+x)^4-\frac{81}{x^4}\right)x,\ \frac{2176}{15}\right\}$$

Numeri complessi – 0

```
Simplify[(-4 - 22 i) / ((1 - 2 i))]
```

$$8-6\,i$$

```
Solve[(1 - 2 i) z^2 == -4 - 22 i, z]
```

$$\{\{z\to -3+i\},\ \{z\to 3-i\}\}$$

Matrici, autovalori – 0

```
a = {{1, k}, {k, 4}}; Print[MatrixForm[a]];
v = {{2}, {1}}; Print[MatrixForm[a.v]]
```

$$\begin{pmatrix}1 & k\\ k & 4\end{pmatrix}$$

$$\begin{pmatrix}2+k\\ 4+2\,k\end{pmatrix}$$

```
b = {{2 + k, 2}, {4 + 2 k, 1}}; Det[b]
```

$$-6-3\,k$$

```
k = -2; Eigenvalues[a]
```

$$\{5,\ 0\}$$

```
Eigenvectors[a]
```

$$\{\{-1,\ 2\},\ \{2,\ 1\}\}$$