

versione 0

Equazioni differenziali – 0

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

```
{{y[x] -> e^{-2x} (-4 + 4 e^{2x} - 3 x - 3 x^2)}}
```

Funzioni di due variabili, punti critici – 0

```
f[x_, y_] := y -  $\frac{8}{x}$ ;
```

```
g1[y_] := f[ $\frac{6}{y}$ , y];
```

```
Print["g1(y) = f( $\frac{6}{y}$ , y) = "];
```

```
Print[g1[y]];
```

```
Print["g2(x) = f(x, 8 - 2x) = "];
```

```
g2[x_] := f[x, 8 - 2x]; Print[g2[x]];
```

```
Print["g2'(x) = "];
```

```
Print[g2'[x]]
```

```
Solve[g2'[x] == 0, x];
```

```
Print[{g2[1], g2[2], g2[6]}]
```

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

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

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

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

```
g2'(x) =
```

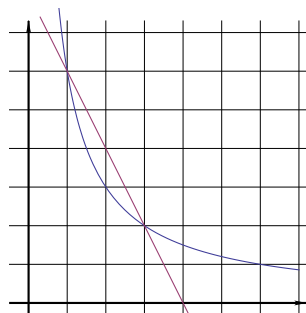
```
 $-2 + \frac{8}{x^2}$ 
```

```
{-2, 0,  $-\frac{16}{3}$ }
```

```
aa = Plot[{6/x, 8 - 2x}, {x, .3, 7},
```

```
AspectRatio -> Automatic];
```

```
figura[1, -.5, 7.2, -.3, 7.3, aa]
```



Integrale doppio – 0

```
f[x_, y_] := x + y^3;
Simplify[{\int_{\frac{6}{y}}^{4-\frac{y}{2}} f[x, y] dx,
\int_2^6 \int_{\frac{6}{y}}^{4-\frac{y}{2}} f[x, y] dx dy}]
{-18 y + 8 y^3 - 2 y^4 + \frac{y^5}{8}, \frac{2176}{15}}
```

```
Simplify[{\int_{\frac{6}{x}}^{8-2x} f[x, y] dy,
\int_1^3 \int_{\frac{6}{x}}^{8-2x} f[x, y] dy dx}]
{4 \left( (-4 + x)^4 - \frac{81}{x^4} \right) x, \frac{2176}{15}}
```

Numeri complessi – 0

```
Simplify[(-4 - 22 i) / ((1 - 2 i))]
8 - 6 i
```

```
Solve[(1 - 2 i) z^2 == -4 - 22 i, z]
{{z -> -3 + i}, {z -> 3 - i}}
```

Matrici, autovalori – 0

```
a = \left( \begin{array}{cc} 1 & k \\ k & 4 \end{array} \right); Print[MatrixForm[a]];
v = \left( \begin{array}{c} 2 \\ 1 \end{array} \right); Print[MatrixForm[a.v]]
```

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

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

```
b = \left( \begin{array}{cc} 2 + k & 2 \\ 4 + 2k & 1 \end{array} \right); Det[b]
-6 - 3 k
```

```
k = -2; Eigenvalues[a]
{5, 0}
```

```
Eigenvectors[a]
{{-1, 2}, {2, 1}}
```