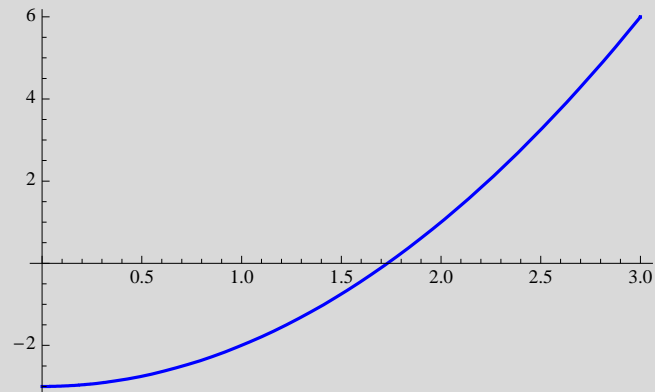


```
(** ESERCIZIO 2.1.10 **)
```

```
Clear[f];  
f[x_] := x^2 - 3;  
Plot[f[x], {x, 0, 3}, PlotStyle -> {RGBColor[0, 0, 1], Thickness[0.005]}
```



```
a = 1.0; b = 2.0;  
tol = 10^(-4);  
fa = f[a];  
fb = f[b];  
an[0] = a; bn[0] = b;  
cn[0] = 0.5 * (a + b);  
test = b - a;  
testbis[0] = bn[0] - an[0];  
nmax = 10;  
n = 1; While[test > tol, {fa = f[an[n - 1]]; fb = f[bn[n - 1]];  
  If[fa * fb < 0, {an[n] = an[n - 1]; bn[n] = cn[n - 1]}, {an[n] = cn[n - 1]; bn[n] = bn[n - 1]}];  
  cn[n] = 0.5 * (an[n] + bn[n]); test = Abs[bn[n] - an[n]]; n++};  
Print["Bisezione: n = ", n - 1, " c = ", cn[n - 1]]  
Clear[x]; test = 1.0; n = 0;  
x[0] = 0.4;  
While[test > tol, {x[n + 1] = x[n] - f[x[n]] / f'[x[n]]; test = Abs[x[n + 1] - x[n]]; n++}  
Print["Newton: n = ", n, " c = ", x[n]]  
Print[" $\sqrt{3}$  = ", Sqrt[3.] ]
```

Bisezione: n = 14 c = 1.73203

Newton: n = 6 c = 1.73205

$\sqrt{3}$ = 1.73205

```
(** ESERCIZIO 2.1.11 **)
```

```
(** ESERCIZIO 2.1.12 **)
```

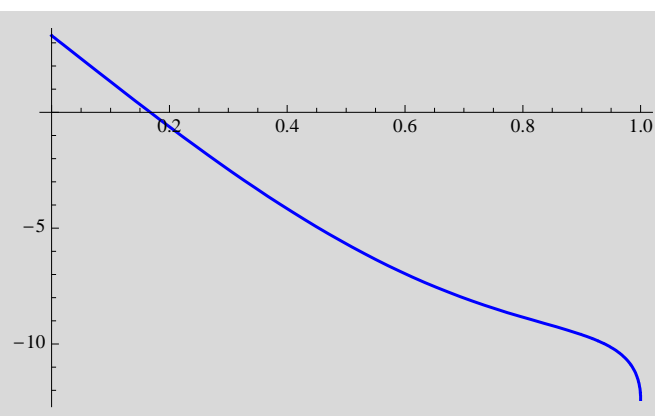
```
Clear[f];
f[x_] := x^3 + x - 4;
a = 1.; b = 4.;
nmax1 = Log[2, (b - a) / tol]
```

14.8727

(** ESERCIZIO 2.1.17 **)

```
Clear[f, V, r, h, L];
f[h_] := L * (r^2 * (0.5 * Pi - ArcSin[h / r]) - h * (r^2 - h^2));
dati = {L → 10., r → 1., V → 12.4}
Plot[(f[h] - V) /. dati, {h, 0, r /. dati},
  PlotStyle → {RGBColor[0, 0, 1], Thickness[0.005]}
```

{L → 10., r → 1., V → 12.4}



```
a = 0.0; b = 0.2;
tol = 10^(-2);
f1[h_] := (f[h] - V) /. dati
fa = f1[a] /. dati
fb = f1[b] /. dati
```

3.30796

-0.625616

```
an[0] = a; bn[0] = b;
cn[0] = 0.5 * (a + b);
test = b - a;
testbis[0] = bn[0] - an[0];
nmax = 10;
n = 1; While[test > tol, {fa = f1[an[n - 1]]; fc = f1[cn[n - 1]];
  If[fa * fc < 0, {an[n] = an[n - 1]; bn[n] = cn[n - 1]}, {an[n] = cn[n - 1]; bn[n] = bn[n - 1]}];
  cn[n] = 0.5 * (an[n] + bn[n]); test = Abs[bn[n] - an[n]]; n++}];
Print["Bisezione: n = ", n - 1, " c = ", cn[n - 1]]
```

Bisezione: n = 5 c = 0.165625