

Funzioni elementari

Monomi, n dispari. Sono funzioni dispari

```
> f:=x->x^n;
```

$$f := x \mapsto x^n$$

```
> g:=x->x^3;
```

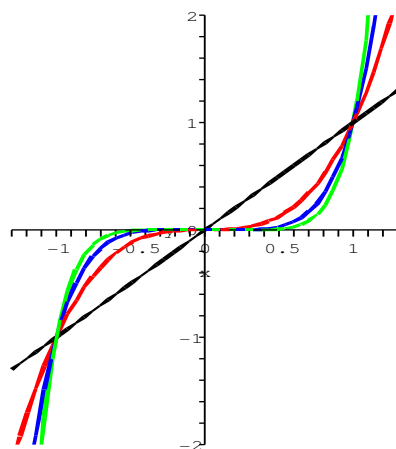
$$g := x \mapsto x^3$$

```
> g(3);
```

27

```
> restart:
```

```
> plot([x,x^3,x^5,x^7],x=-1.3..1.3,y=-2..2,color=[black,red,blue,green],thickness=2);
```



Notare la simmetria rispetto all'origine

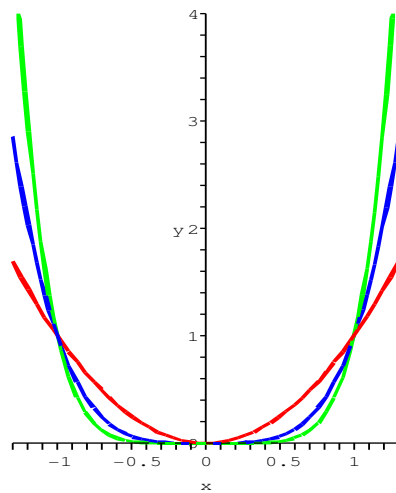
Monomi, n pari. Sono funzioni pari

```
> f:=x->x^n;
```

$$f := x \mapsto x^n$$

```
> restart:
```

```
> plot([x^2,x^4,x^6],x=-1.3..1.3,y=0..4,color=[red,blue,green],thickness=2);
```



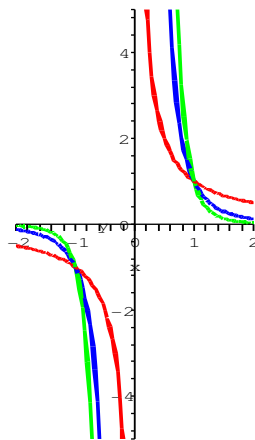
Notare la simmetria rispetto all'asse y
Funzioni razionali, n dispari

> `f:=x->1/x^n;`

$$f := x \mapsto (x^n)^{-1}$$

> `restart:`

> `plot([1/x,1/x^3,1/x^5],x=-2..2,y=-5..5,color=[red,blue,green],thickness=2,discont=true)`



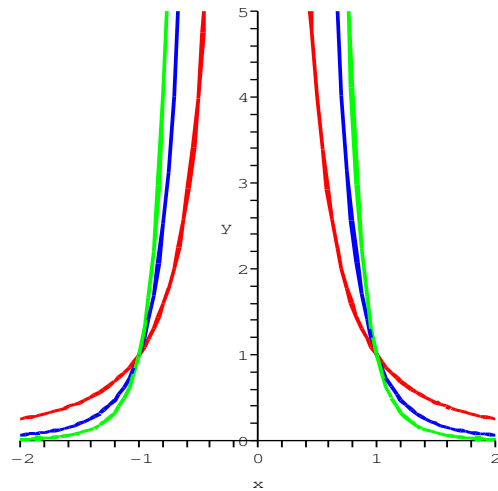
Funzioni razionali, n pari

```
> f:=x->1/x^n;
```

$$f := x \mapsto (x^n)^{-1}$$

```
> restart:
```

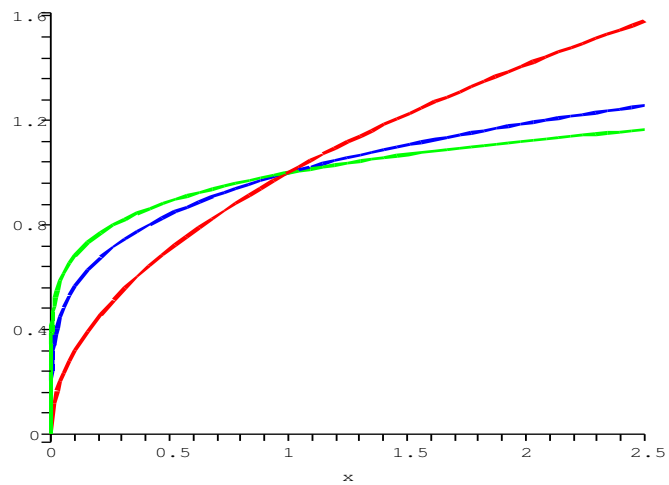
```
> plot([1/x^2,1/x^4,1/x^6],x=-2..2,y=0..5,color=[red,blue,green],thickness=2,discont=tru
```



Radici, n pari

```
> restart:
```

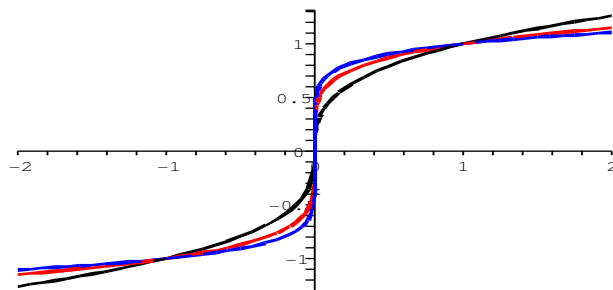
```
> plot([x^(1/2),x^(1/4),x^(1/6)],x=0..2.5,color=[red,blue,green],thickness=2);
```



Radici, n dispari

$\text{surd}(x,3)$ significa radice cubica di x . surd e' la radice dispari in campo reale. La radice pari puo' essere espressa con esponente frazionario, vedi anche i grafici successivi

```
> restart;
> plot([surd(x,3),surd(x,5),surd(x,7)],x=-2..2,color=[black,red,blue],thickness=2);
```



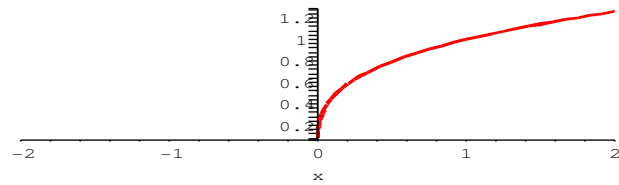
```
> f:=x->x^(1/3);
               
$$f := x \mapsto \sqrt[3]{x}$$

> evalf(f(-8));evalf(f(8));
               1.0 + 1.732050807 i
               2.0
```

il precedente risultato dipende dal fatto che MAPLE lavora in campo complesso.

Nel grafico successivo, in cui e' chiaro che consideriamo una funzione reale di variabile reale, MAPLE intende disegnare una potenza a esponente reale e quindi la base deve essere positiva

```
> plot(x^(1/3),x=-2..2,thickness=2);
```



Relazioni , $x \geq 0$

> **restart:**

> **f1:=x->x^2;f2:=x->x^3;f3:=x->x^(1/2);f4:=x->x^(1/3);**

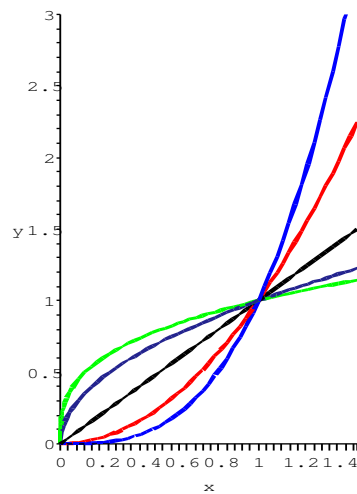
$$f1 := x \mapsto x^2$$

$$f2 := x \mapsto x^3$$

$$f3 := x \mapsto \sqrt{x}$$

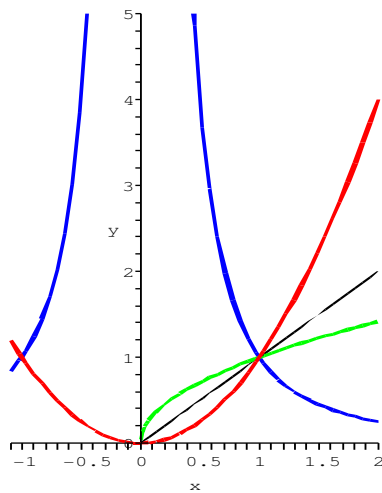
$$f4 := x \mapsto \sqrt[3]{x}$$

> **plot([x,f1(x),f2(x),f3(x),f4(x)],x=0..1.5,y=0..3,colour=[black,red,blue,navy,green],t**



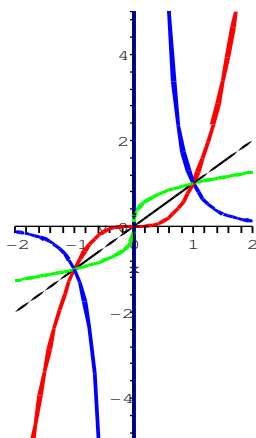
Relazioni, n pari

```
> restart:
> f1:=x->x^2;f2:=x->1/x^2;f3:=x->x^(1/2);
       $f1 := x \mapsto x^2$ 
       $f2 := x \mapsto x^{-2}$ 
       $f3 := x \mapsto \sqrt{x}$ 
> plot([x,f1(x),f2(x),f3(x)],x=-1.0899..2,y=0..5,color=[black,red,blue,green],thickness=
```



Relazioni, n dispari

```
> restart:
> f1:=x->x^3;f2:=x->1/x^3;f3:=x->surd(x,3);
       $f1 := x \mapsto x^3$ 
       $f2 := x \mapsto x^{-3}$ 
       $f3 := x \mapsto \text{surd}(x, 3)$ 
> plot([x,f1(x),f2(x),f3(x)],x=-2..2,y=-5..5,color=[black,red,blue,green],thickness=[1,2
```



La funzione seno

```
> restart;
> evalf(sin(30));evalf(sin(Pi/6));
      -0.9880316241
      0.5000000000
> Pi=evalf(Pi);30/Pi=evalf(30/Pi),30=evalf(30/Pi)*Pi;30=10*Pi+(30/Pi-10)*Pi;sin(30)=evalf(sin(30));
      pi = 3.141592654
      30 pi^-1 = 9.549296583, 30 = 9.549296583 pi
      30 = 10 pi + (30 pi^-1 - 10) pi
      sin(30) = -0.9880316253
> plot(sin(x),x=-8..8);
```

