

Idoneità di Informatica

Lezione 2

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10^2	10^1	10^0
centinaia	decine	unità
5	0	0

Sistema a base 10
Sistema decimale

Il sistema decimale

**{0;1;2;3;4;
5;6;7;8;9}**

237

237

2

1

0

$$2 \times 10^2 = 200$$

$$7 \times 10^0 = 7$$

$$3 \times 10^1 = 30$$

X^2

X^1

X^0

centinaia

decine

unità

Sistema a base X

Il sistema binario $\{0;1\}$

2^2 2^1 2^0

1 0 1

Sistema a base 2

101

2

1

0

$$1 \times 2^2 = 4$$

$$0 \times 2^1 = 0$$

$$1 \times 2^0 = 1$$

101

in binario

esprime

il numero 5

101_2

$=$

5_{10}

237

2

1

0

$$2 \times 10^2 = 200$$

$$7 \times 10^0 = 7$$

$$3 \times 10^1 = 30$$

**Qual è la sequenza
di bit che esprime
237
in binario?**

$$237 =$$

$$128 + 64 + 32$$

$$+ 8 + 4 + 1$$

**(cercare una combinazione
di potenze di 2)**

$$237 =$$

$$2^7 + 2^6 + 2^5$$

$$+ 2^3 + 2^2 + 2^0$$

$$237 =$$

$$2^7 + 2^6 + 2^5$$

$$+ 2^3 + 2^2 + 2^0$$

(mettere un 1 nelle posizioni
indicate dagli esponenti
e 0 nelle altre)

11101101

⋮

7

⋮

6

⋮

5

⋮

4

⋮

3

⋮

2

⋮

1

⋮

0

11101101_2

$=$

237_{10}

Esercizio

**Convertite i seguenti numeri da
base 2 a base 10:
111, 1000, 11011.**

Esercizio

**Convertite i seguenti numeri da
base 10 a base 2:
9, 23, 144, 201.**



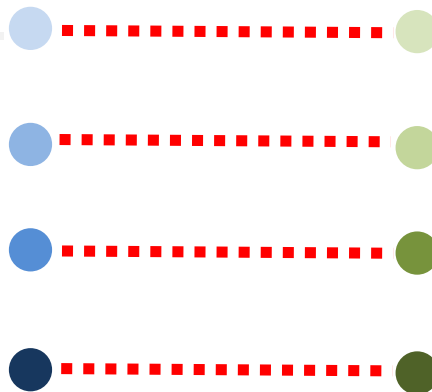


CODIFICA:

corrispondenza biunivoca tra
un insieme di entità di qualsiasi
tipo e un insieme di numeri
naturali.

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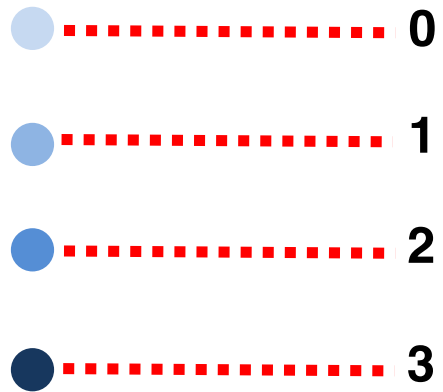


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corrispondenza biunivoca tra
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tipo e un insieme di numeri
naturali.



CODIFICA



USASCII code chart

b7 b6 b5 b4 b3 b2 b1 Column Row					0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
					0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	\	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	\$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

USASCII code chart

b7 b6 b5 b4 b3 b2 b1 Column Row					0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
					0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	\	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	\$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

E



E







0 1 2 3

1

2

3

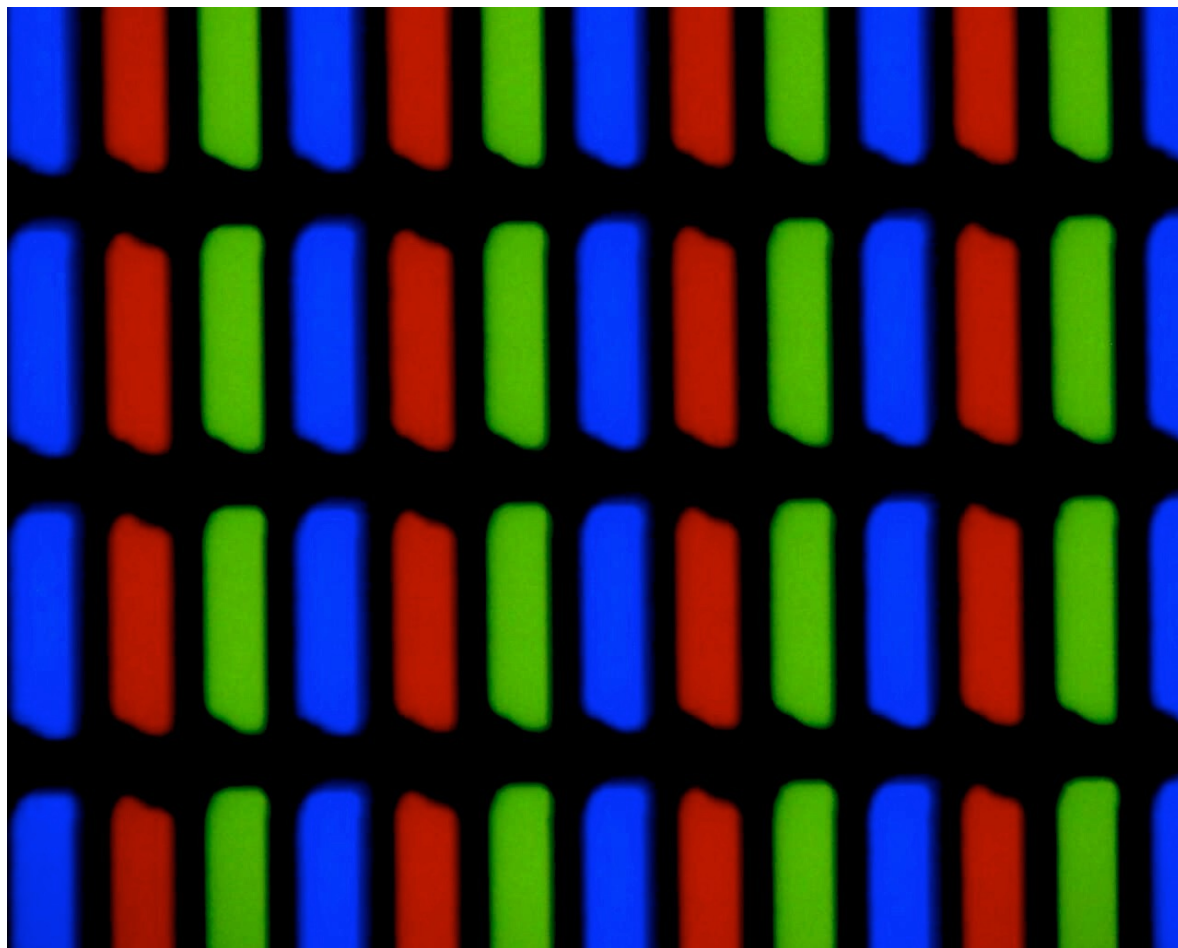
Immagine inserita in un piano
cartesiano con coordinate (x,y)

 (9,14)

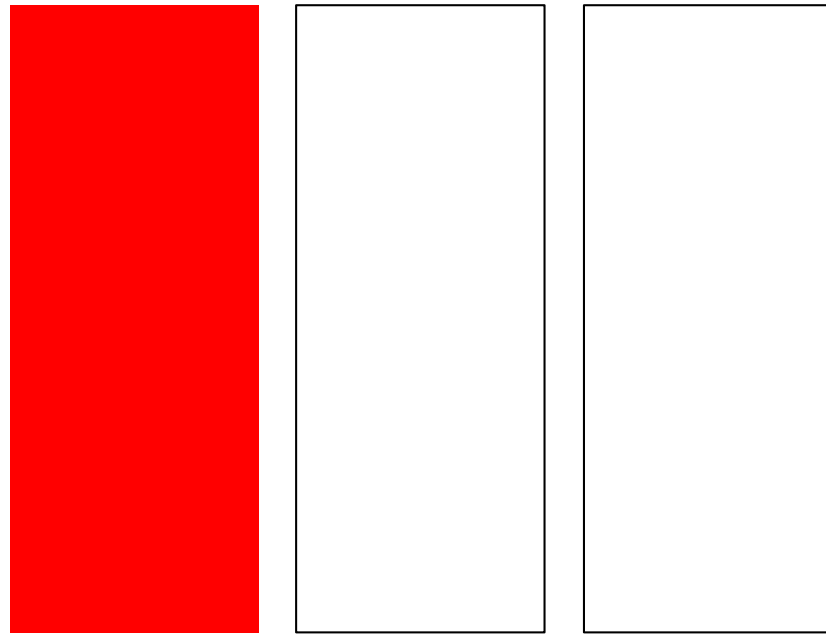
Schermo



Schermo, ingrandito 300x

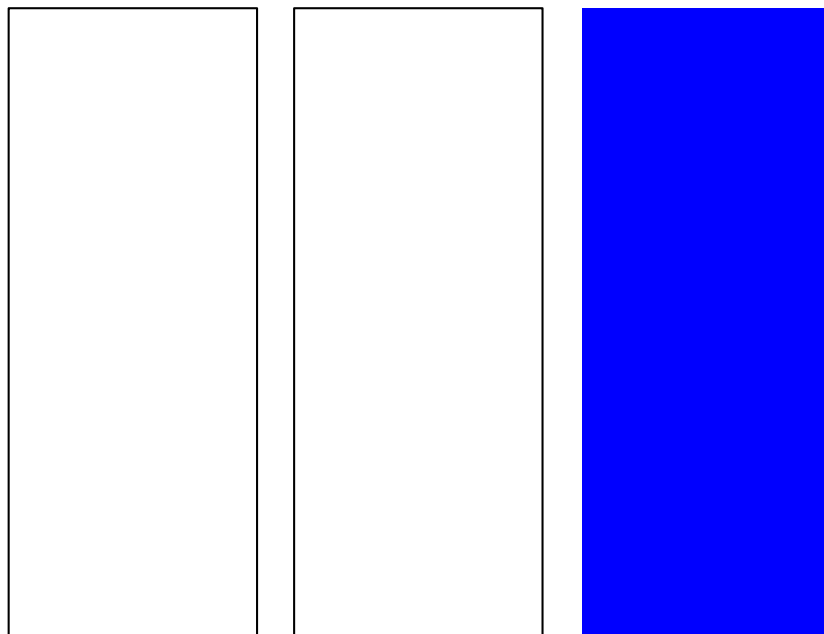


Rosso



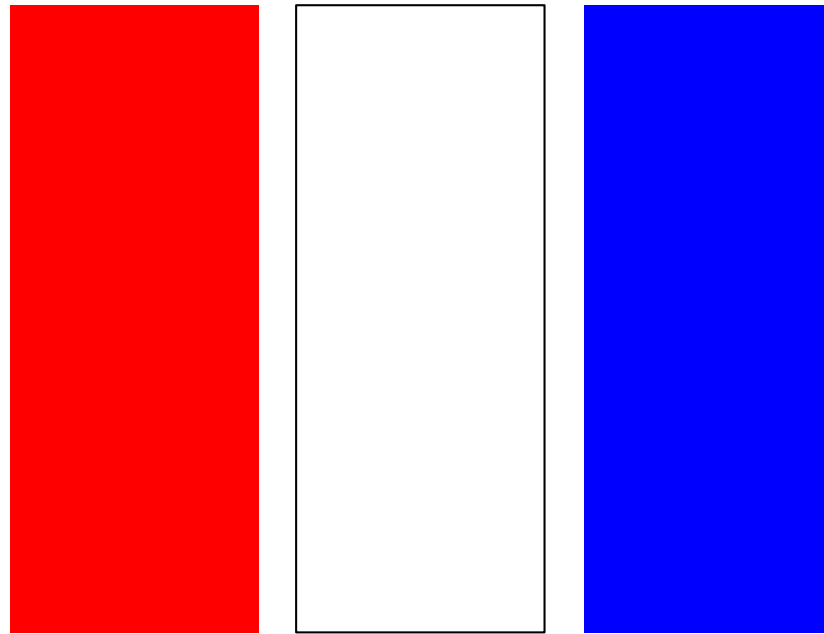
(255,0,0)

Blu

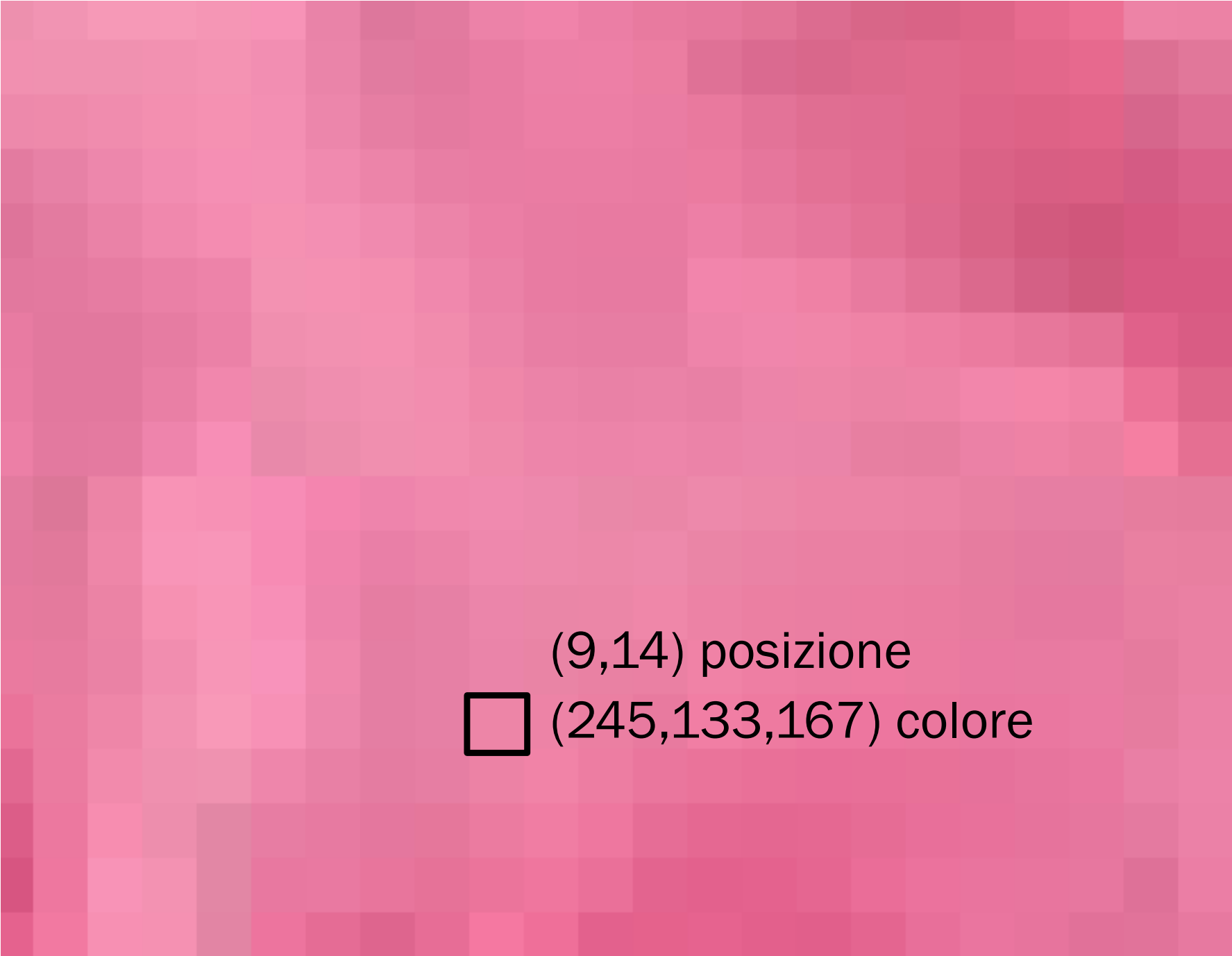


(0,0,255)

Viola



(255,0,255)



(9,14) posizione

 (245,133,167) colore



x y r g b
□ (9,14,245,133,167)

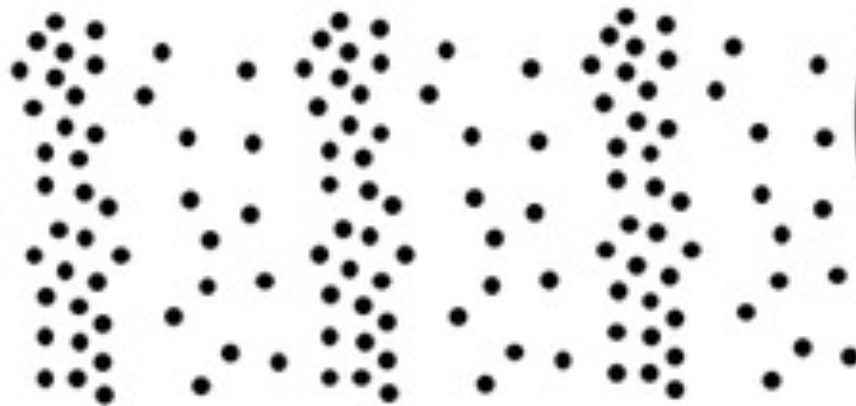
(9,14,245,133,167)

3,217) (8,87,245,133,167) (9,03,245,133,167) (9,18,245,133,152) (8,88,245,200,211) (9,04,245,133,167) (9,19,245,133,007) (8,89,245,150,167) (9,05,245,133,180) (9,20,245,133,098) (8,90,245,133,167) (9,06,245,133,167) (9,21,245,173,111) (8,91,245,133,167) (9,07,245,110,100) (9,22,215,133,167) (8,92,245,133,167) (9,08,245,133,200) (9,23,250,133,168) (8,93,245,099,001) (9,09,245,133,201) (9,24,245,133,122) (8,94,245,133,167) (9,10,251,133,167) (9,25,245,133,250) (8,95,245,133,167) (9,11,240,133,167) (9,26,245,133,077) (8,96,245,133,167) (9,12,245,133,088) (9,27,245,133,199) (8,97,245,133,167) (9,13,245,099,071) (9,28,245,133,023) (8,98,245,133,167) (9,14,245,133,167) (9,29,245,133,071) (8,99,245,133,167) (9,15,245,133,167) (9,30,245,133,185) (9,01,245,133,167) (9,16,245,099,121) (9,31,245,133,130) (9,02,245,133,167) (9,17,245,133,167) (9,32,245,13





Vibrating air molecules



Ear



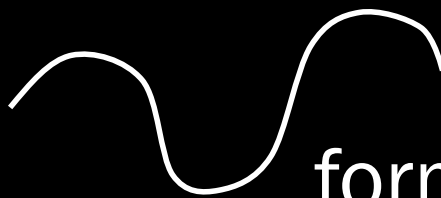
ampiezza / volume



frequenza / altezza



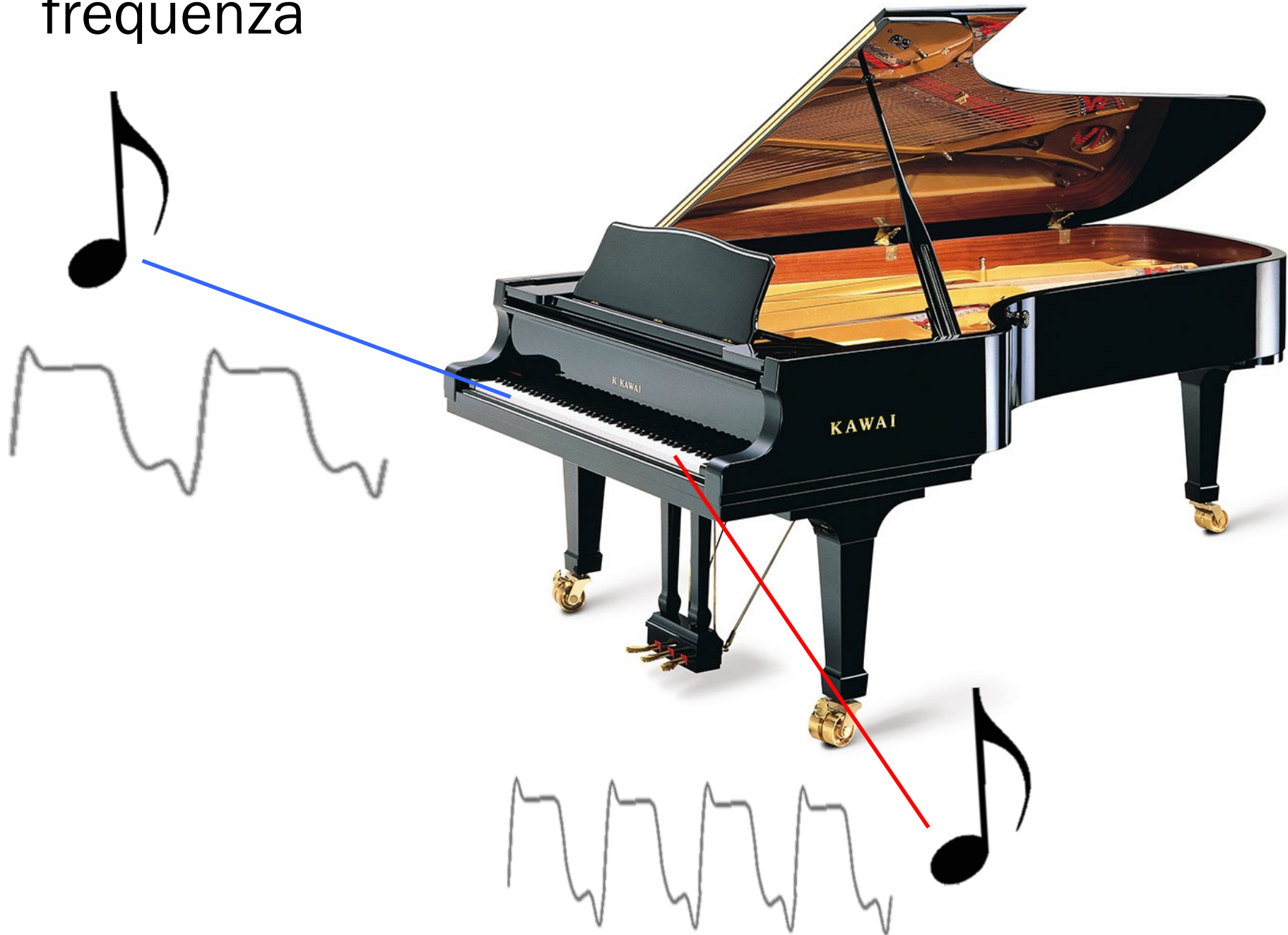
forma d'onda / timbro



altezza



frequenza



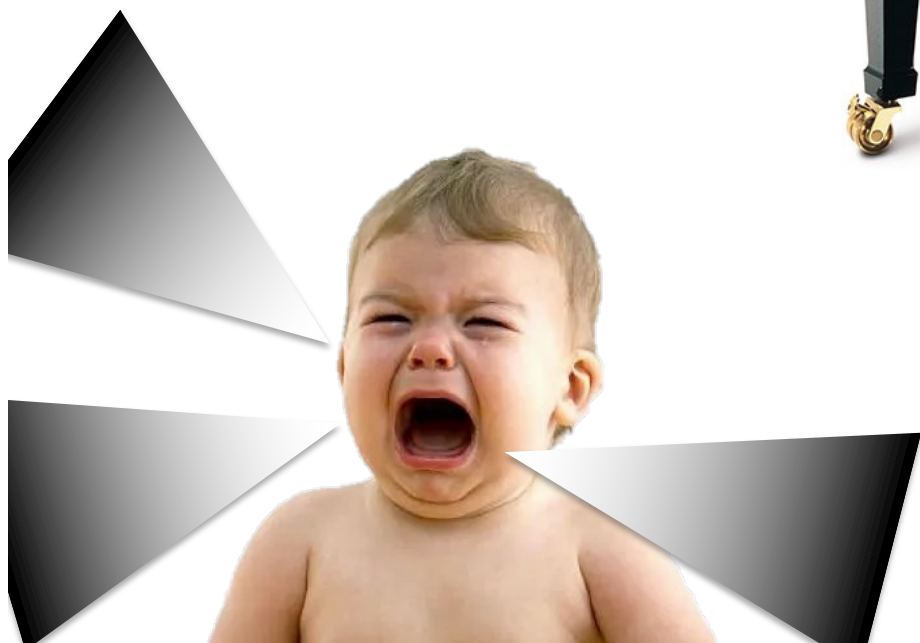
volume



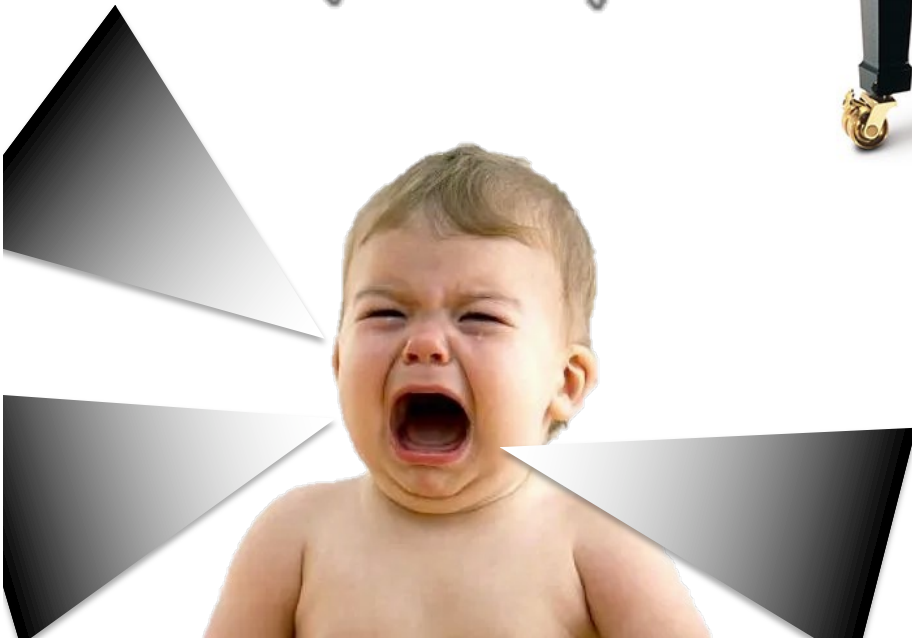
ampiezza

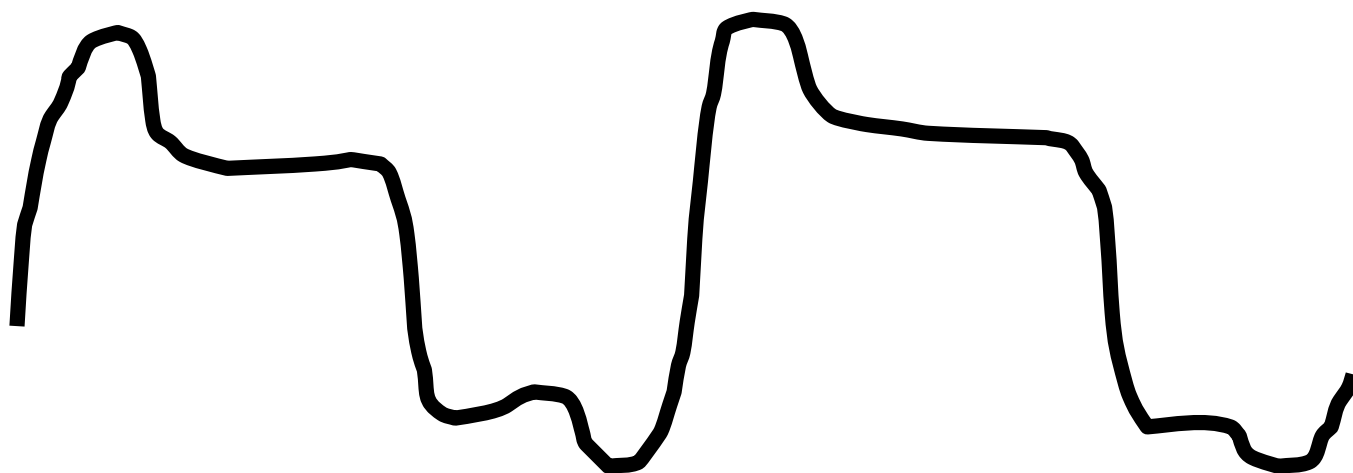


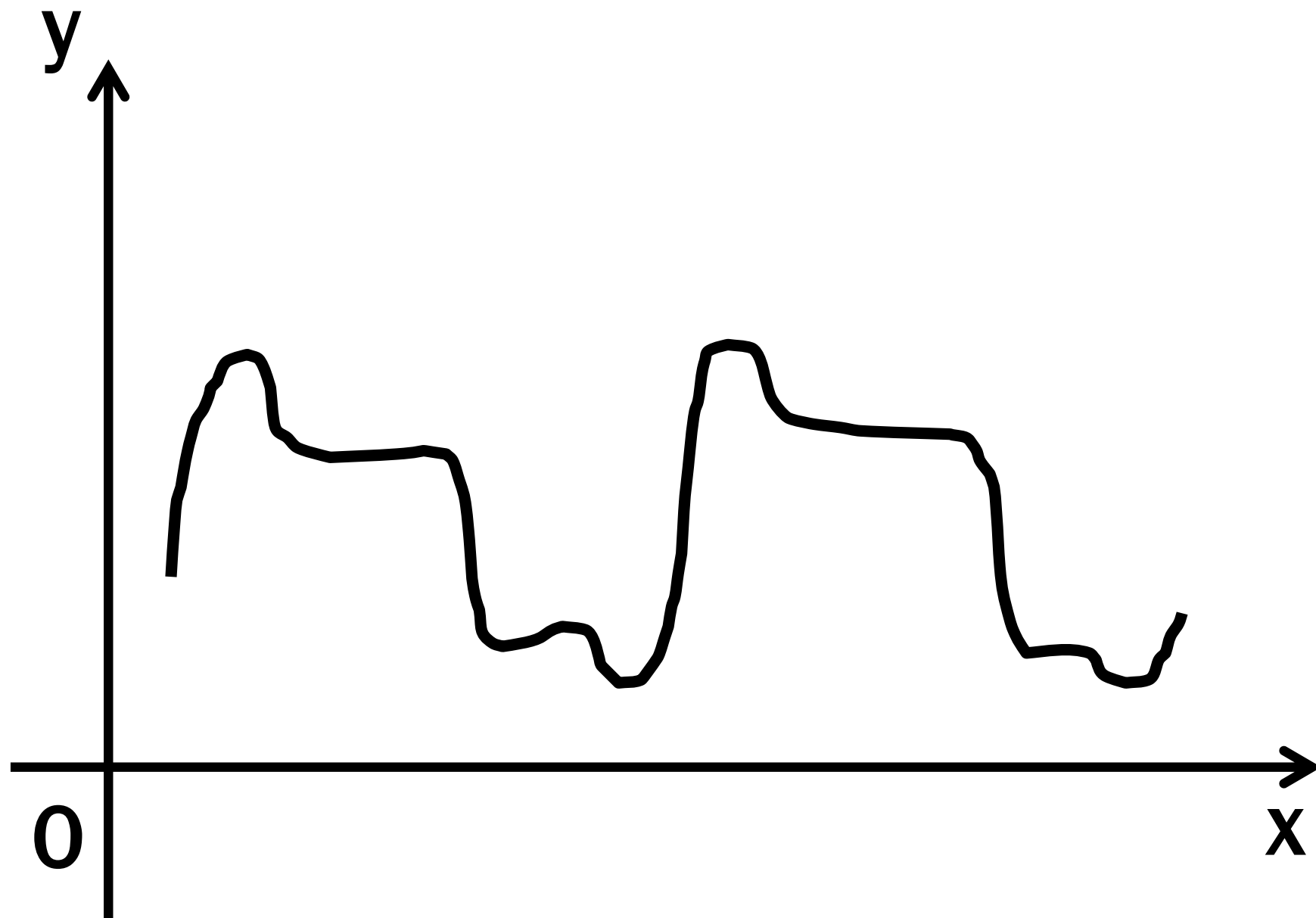
timbro

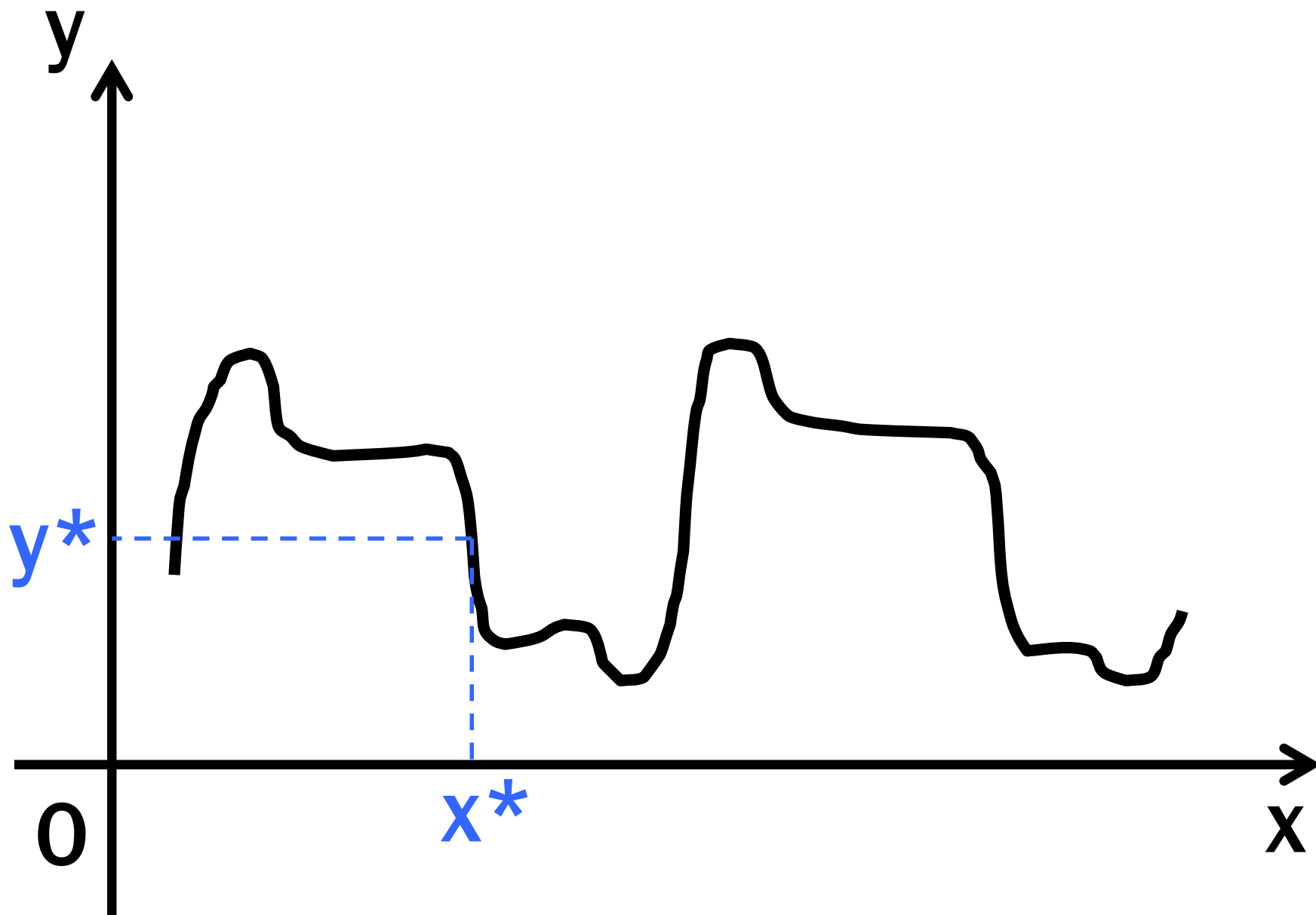


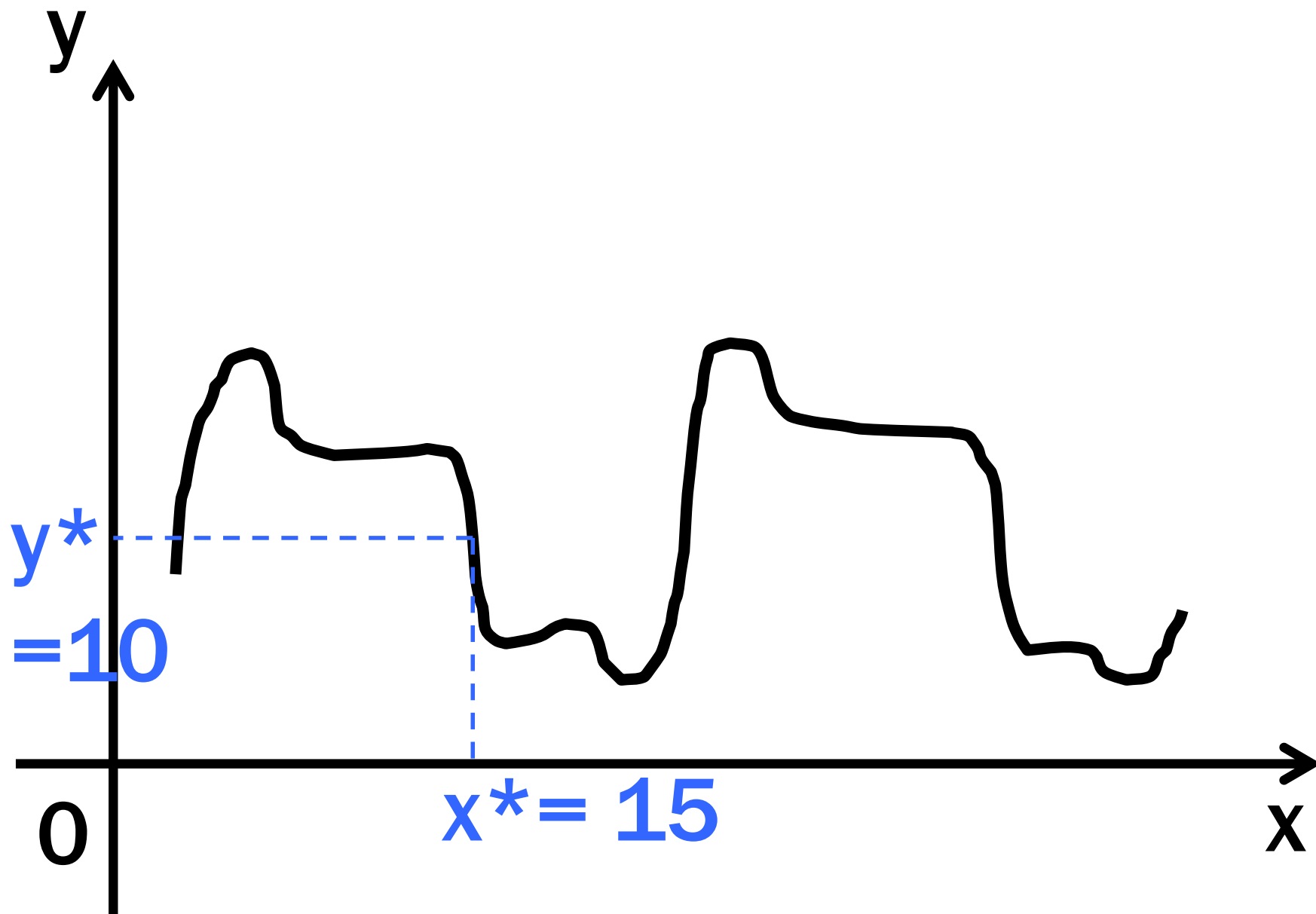
forma d'onda

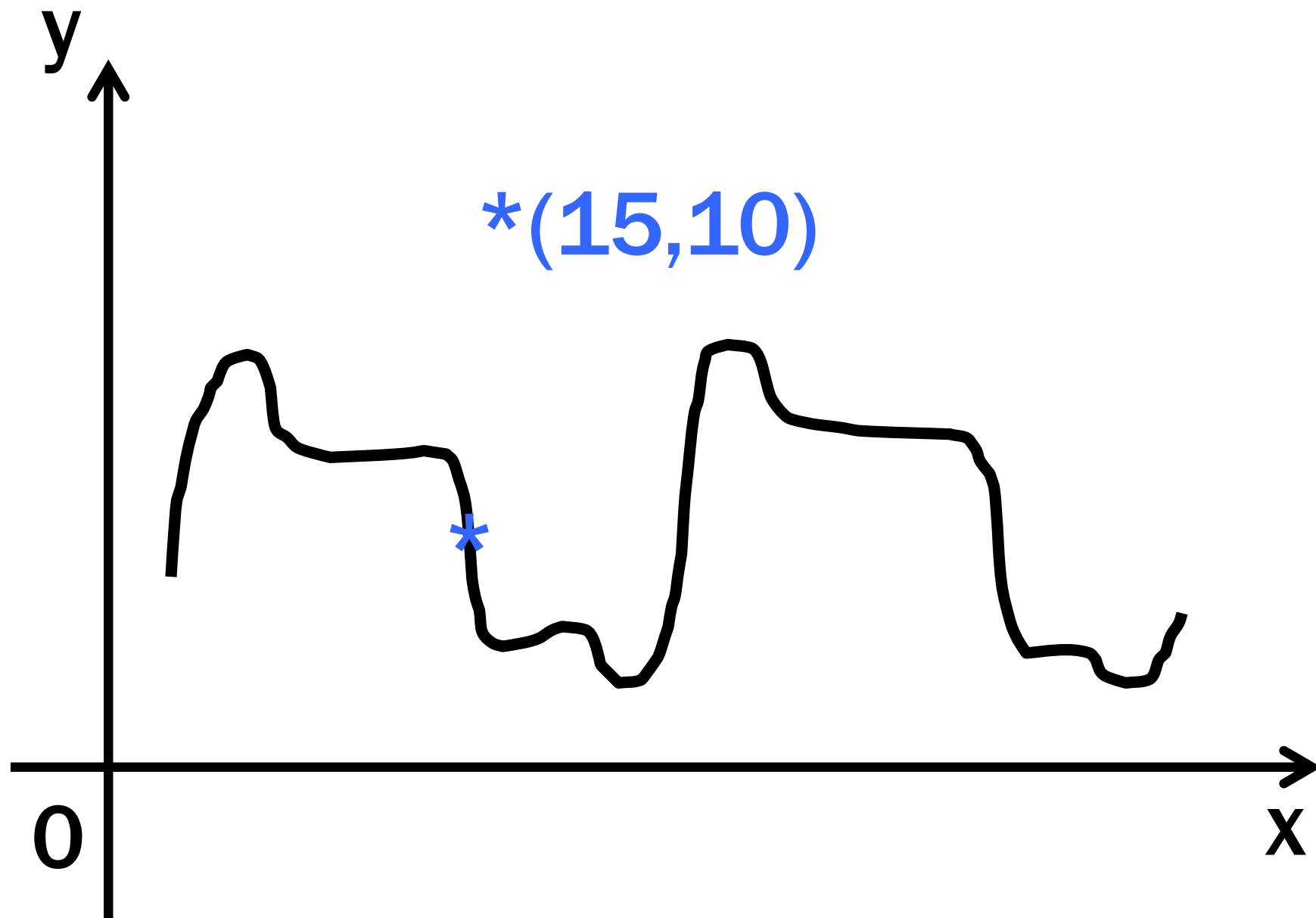


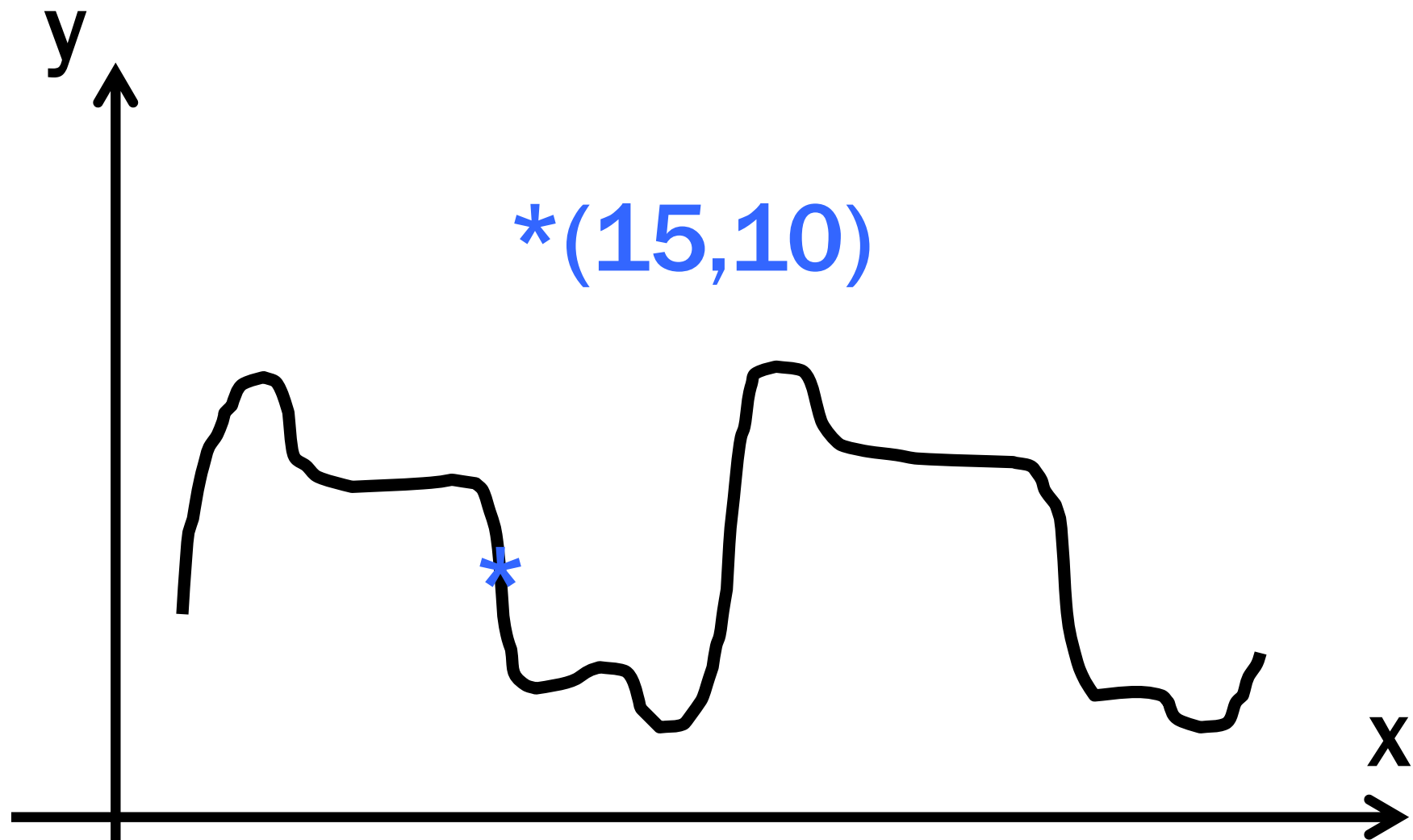






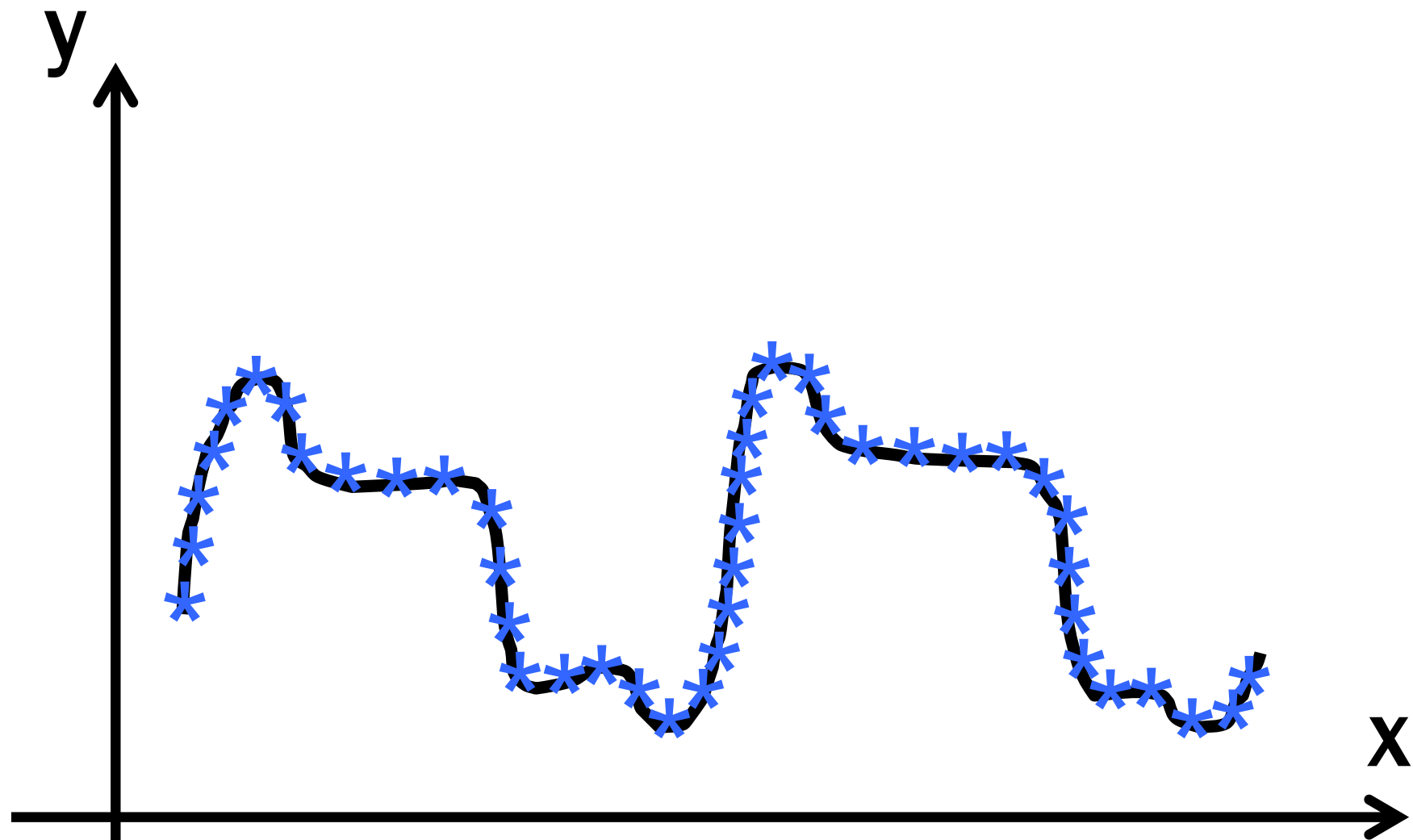




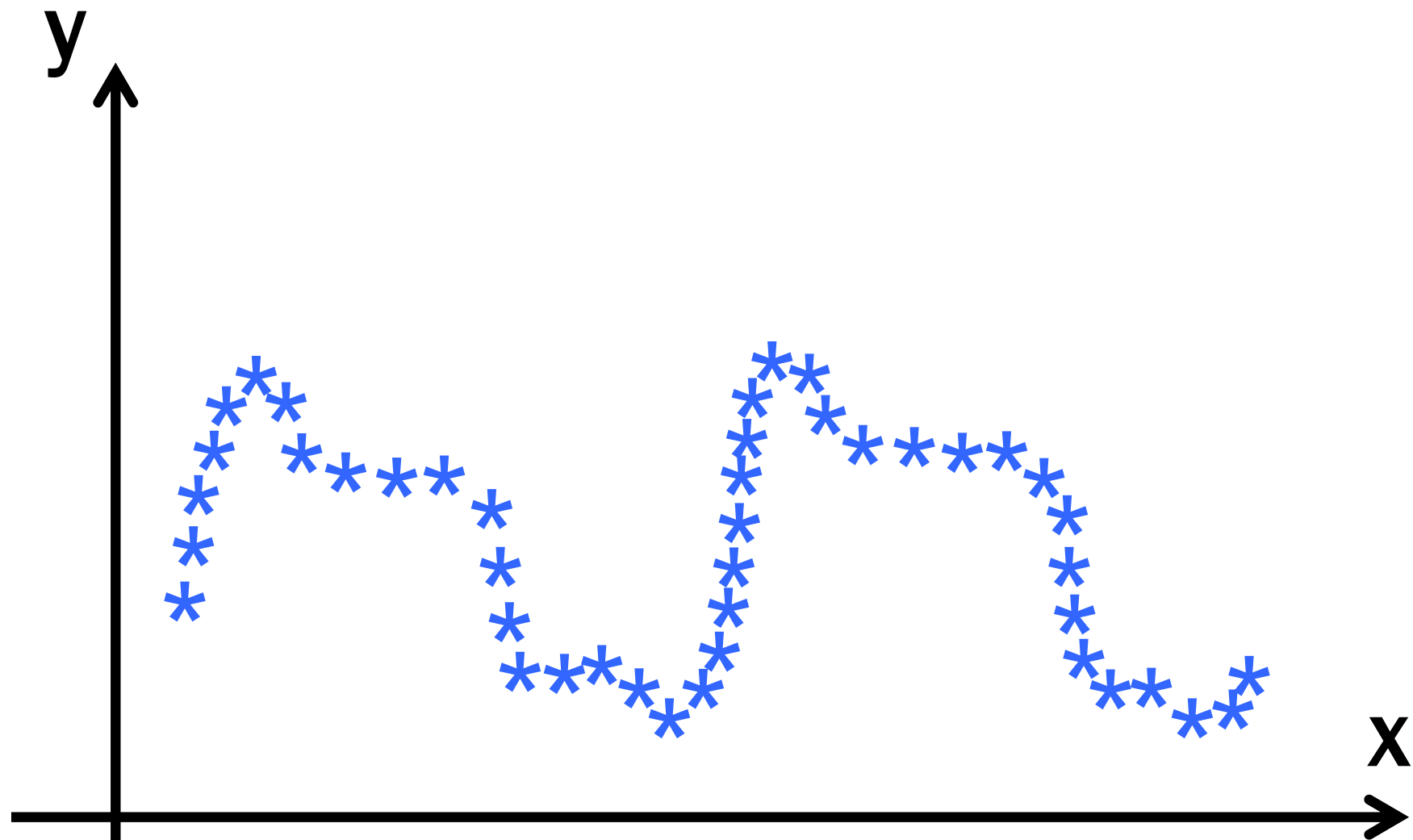


0 Si riescono a gestire le coordinate (x,y) di un numero infinito di punti geometrici?

Ovviamente no.

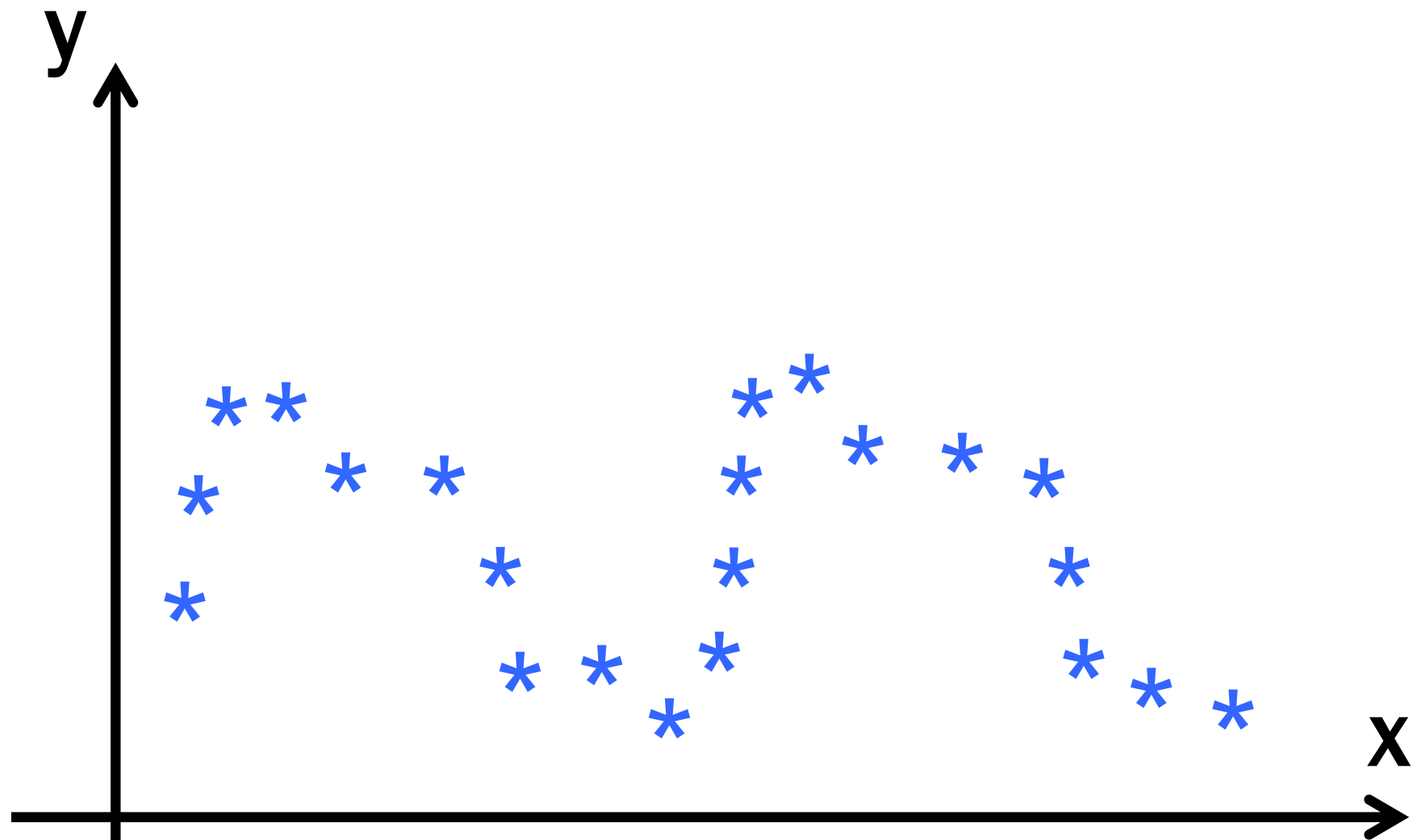


0 **Campionamento**



0

Molti campioni



0 **Meno campioni**

La necessità di hardware

- La tecnologia digitale ha bisogno di strumenti materiali che convertono numeri in fenomeni fisici



