FORMATIONS AUX STATISTIQUES : MANUEL DU FORMATEUR DE NIVEAU 1

Janvier 1991

SCÉNARIO 5

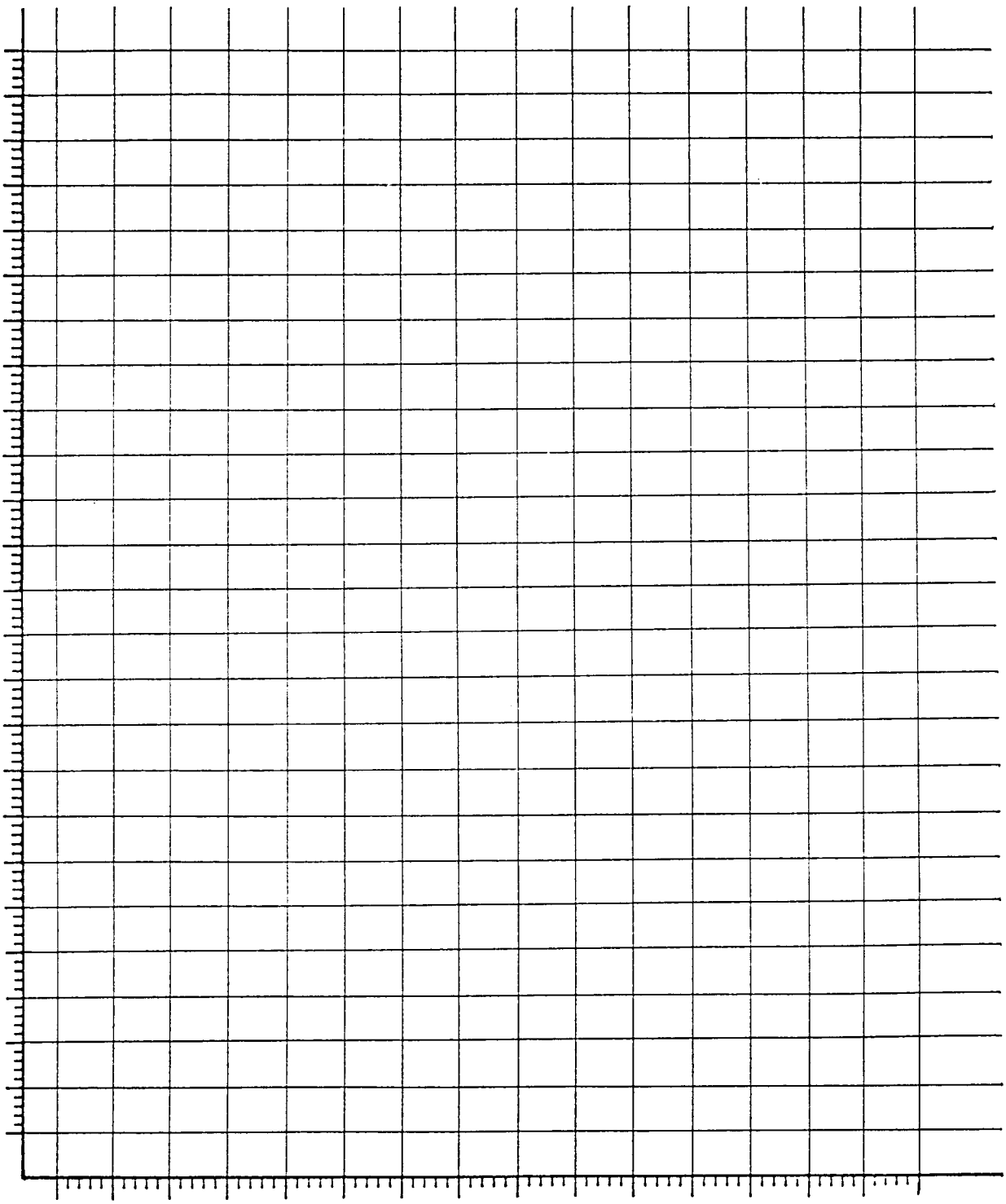
Liaison entre deux variables

INRA

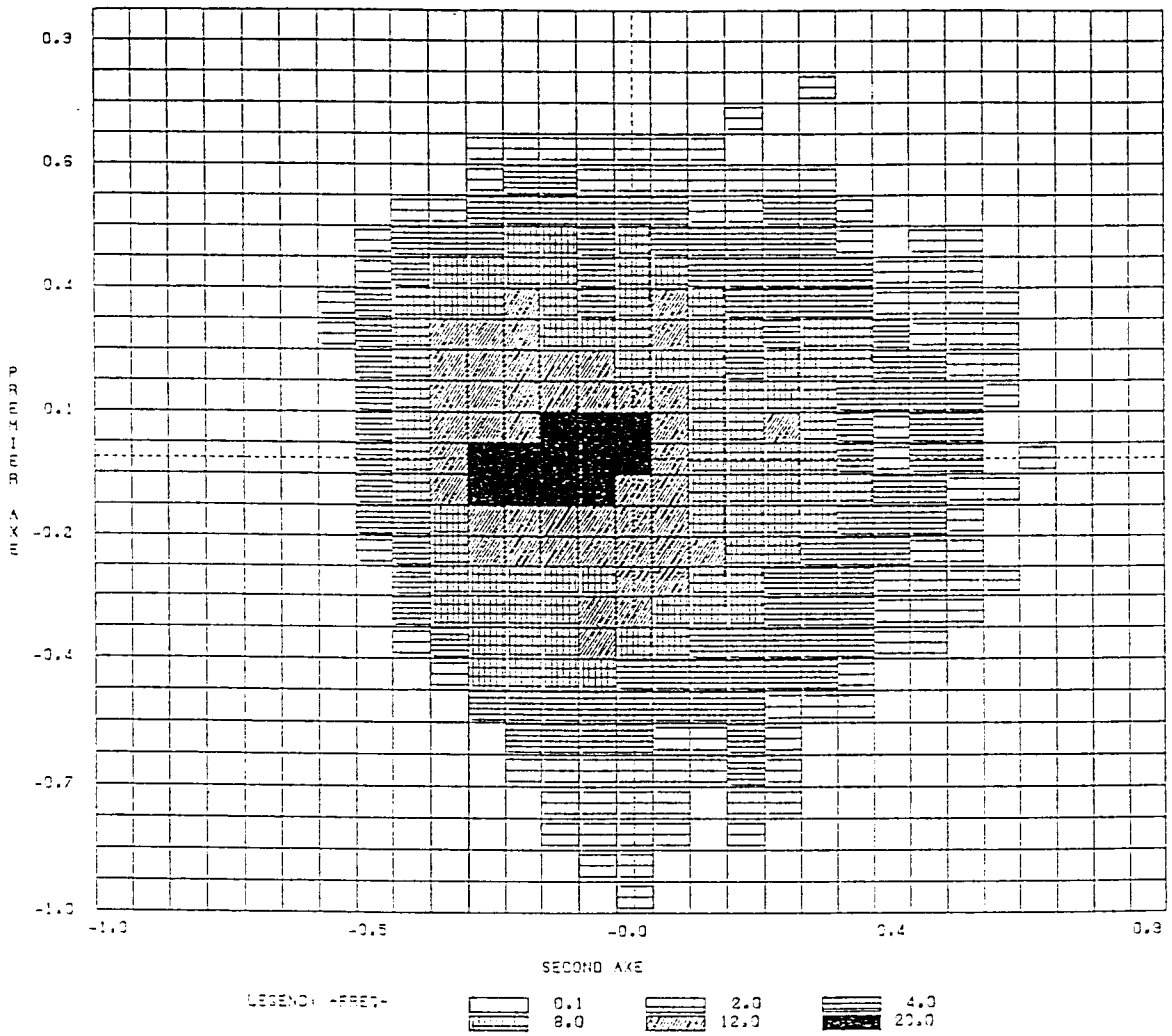
TRANSPARENTS

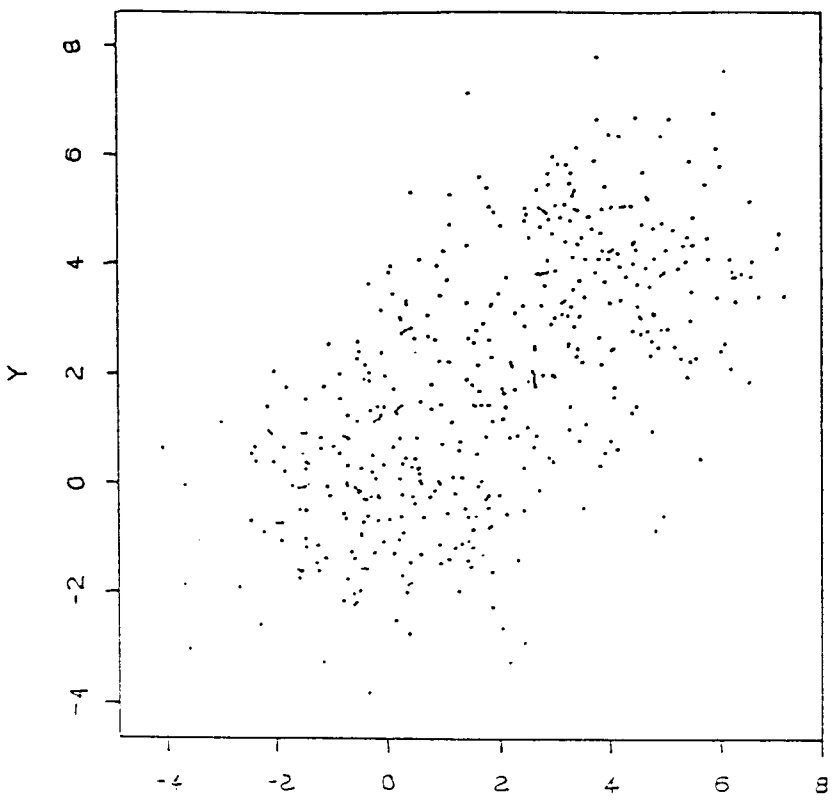
DÉPARTEMENT DE BIOMÉTRIE

formation permanente fp



PLAGES D'EGALE DENSITE
NUAGE GLOBAL




Y
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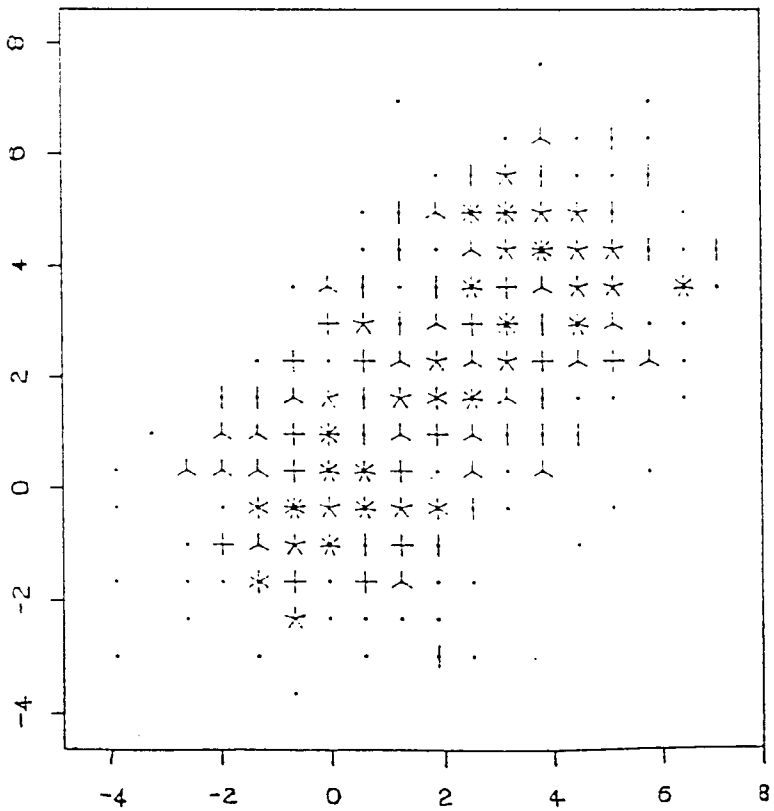
2
0
-2
-4
-4
-2
0
2
4
6
8


8
6
4
2
0
-2
-4
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-2
0
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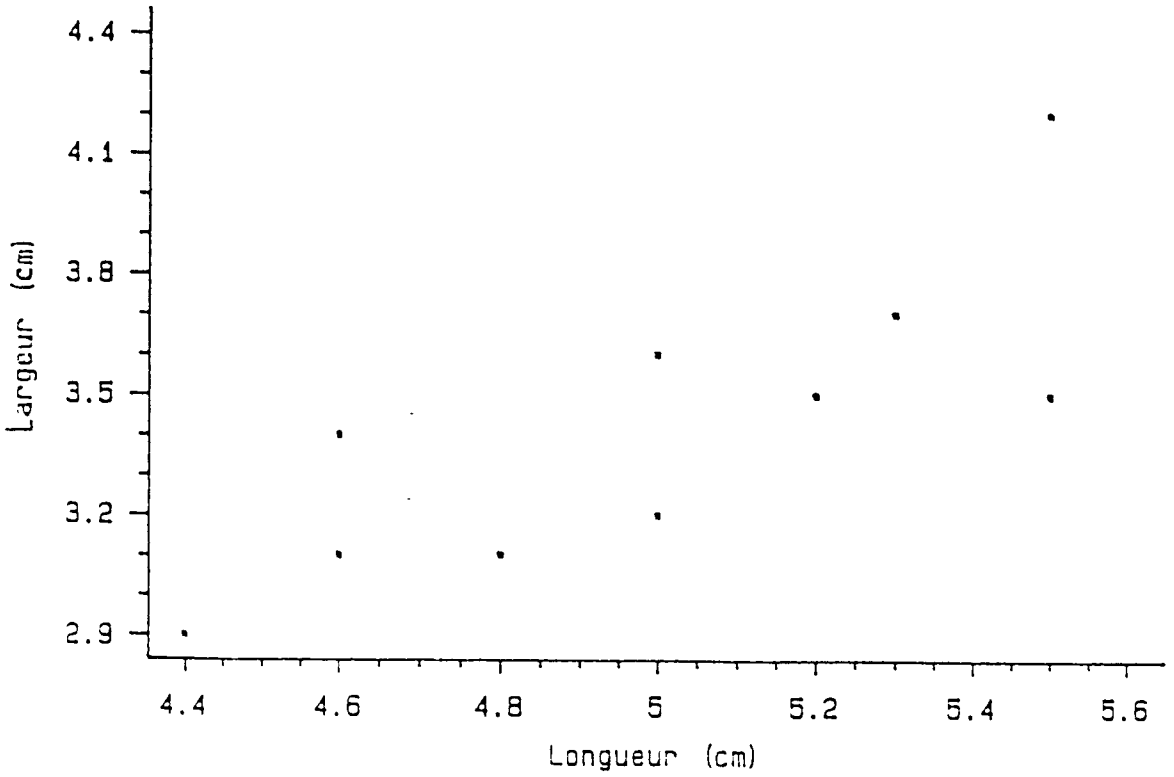
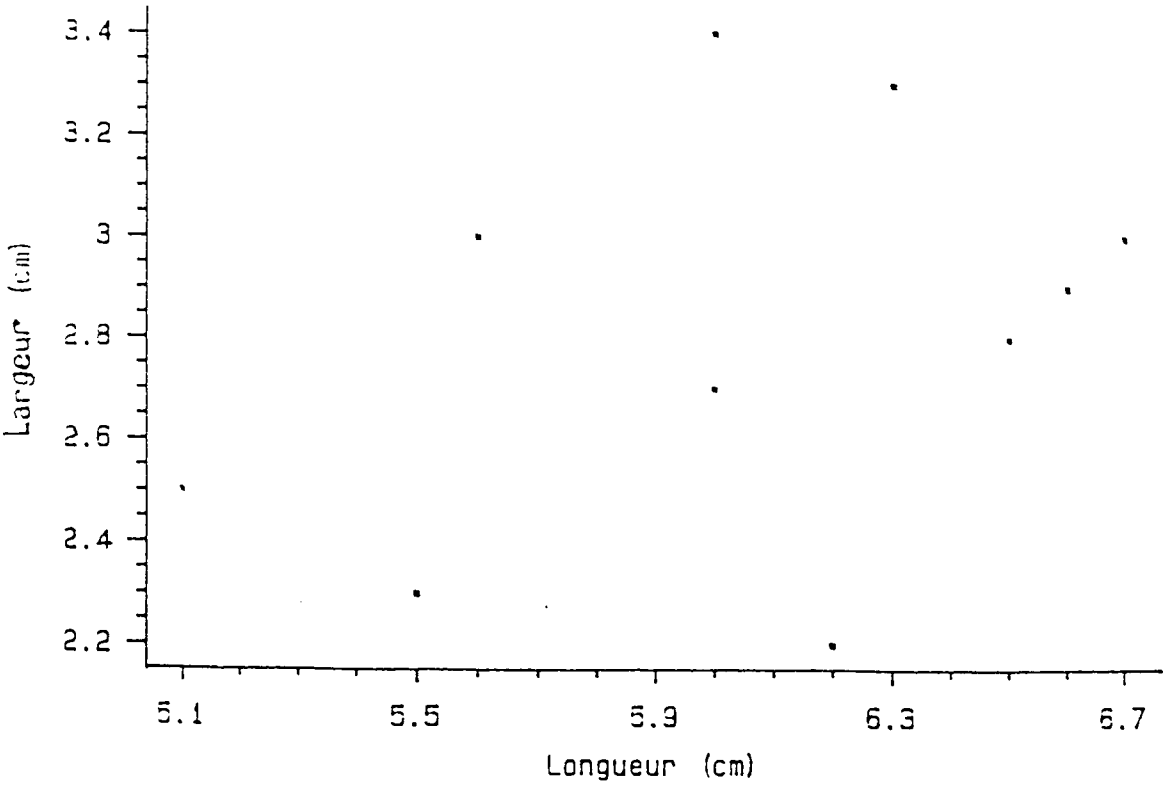
4
6
8

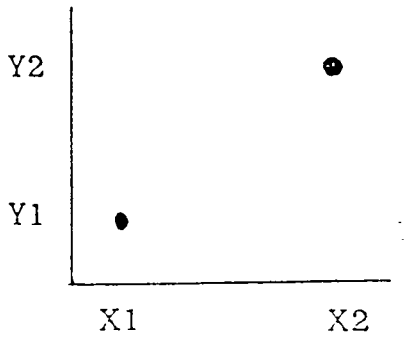
RELATION ENTRE LONGUEUR ET LARGEUR DES SEPALES CHEZ L'ESPECE Iris setosa



RELATION ENTRE LONGUEUR ET LARGEUR DES SEPALES CHEZ L'ESPECE Iris versicolor

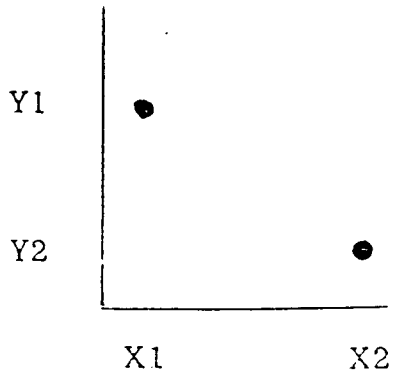


CONCORDANCE – DISCORDANCE



paire CONCORDANTE:

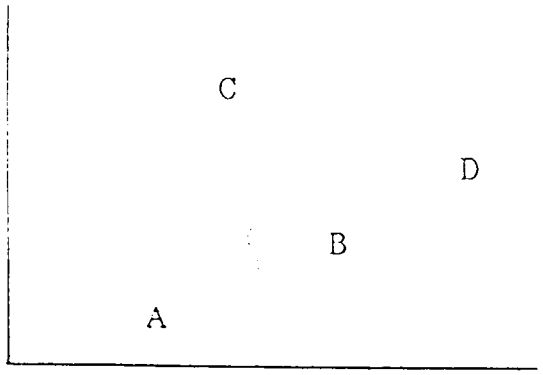
quand X augmente, alors Y augmente



paire DISCORDANTE:

quand X augmente, alors Y diminue

EXEMPLE



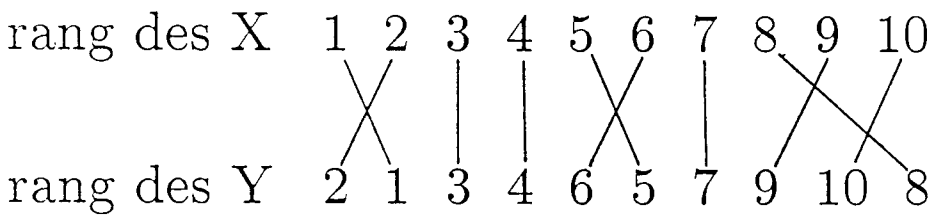
paires concordantes:
- A/B
- A/C
- A/D
- B/D

paires discordantes:
- B/C
- C/D

MÉTHODE GRAPHIQUE : POUR COMPTER LES DISCORDANCES

Les X sont rangées dans l'ordre croissant, on reporte en face les rangs des valeurs de Y correspondantes.

Exemple :



les rangs de X et de Y de même ordre sont reliés entre eux.

Nombre d'intersections = nombre de paires discordantes

COEFFICIENT DE CORRÉLATION τ DE KENDALL

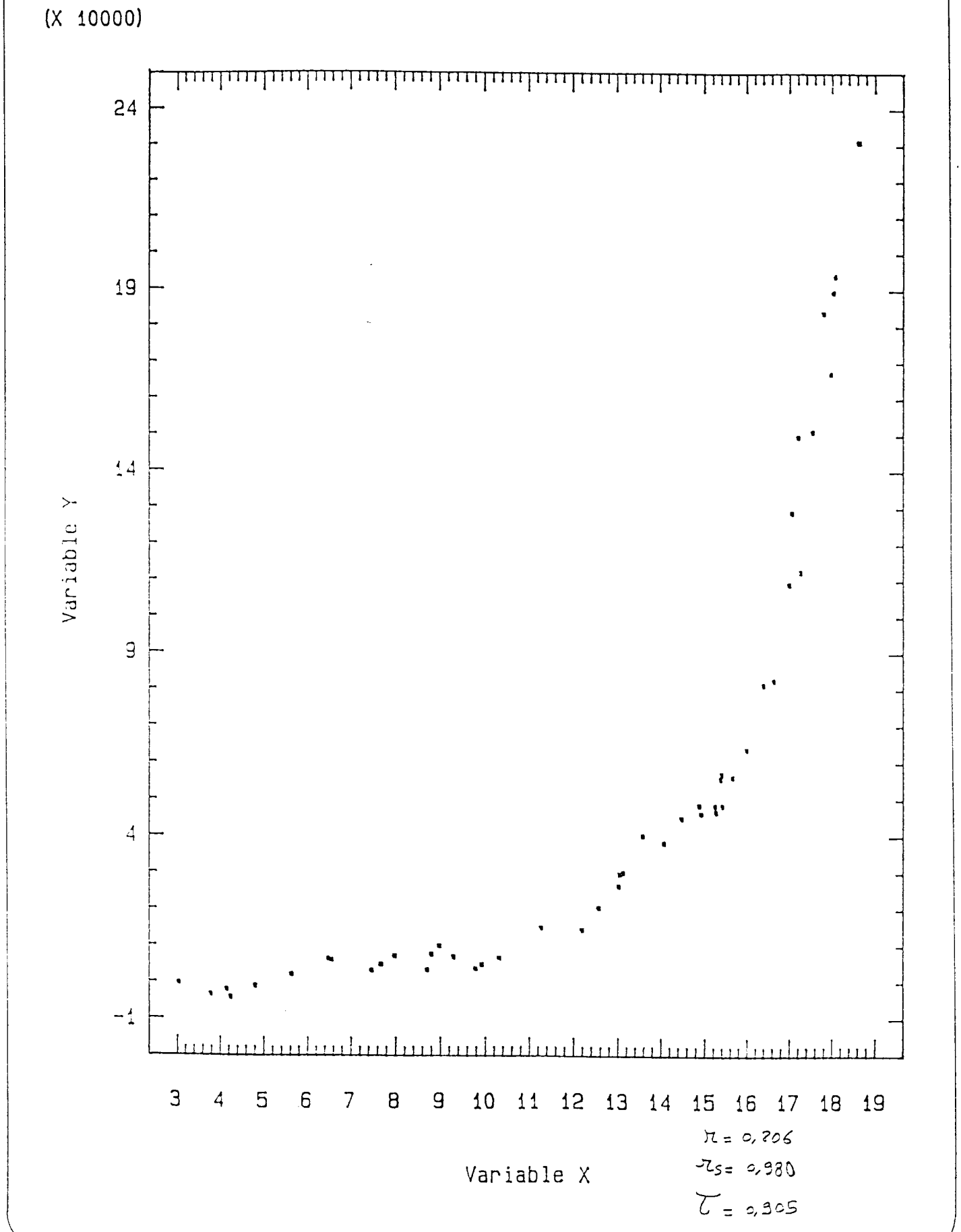
calcul :

S = (nb de paires concordantes) − (nb de paires discordantes)

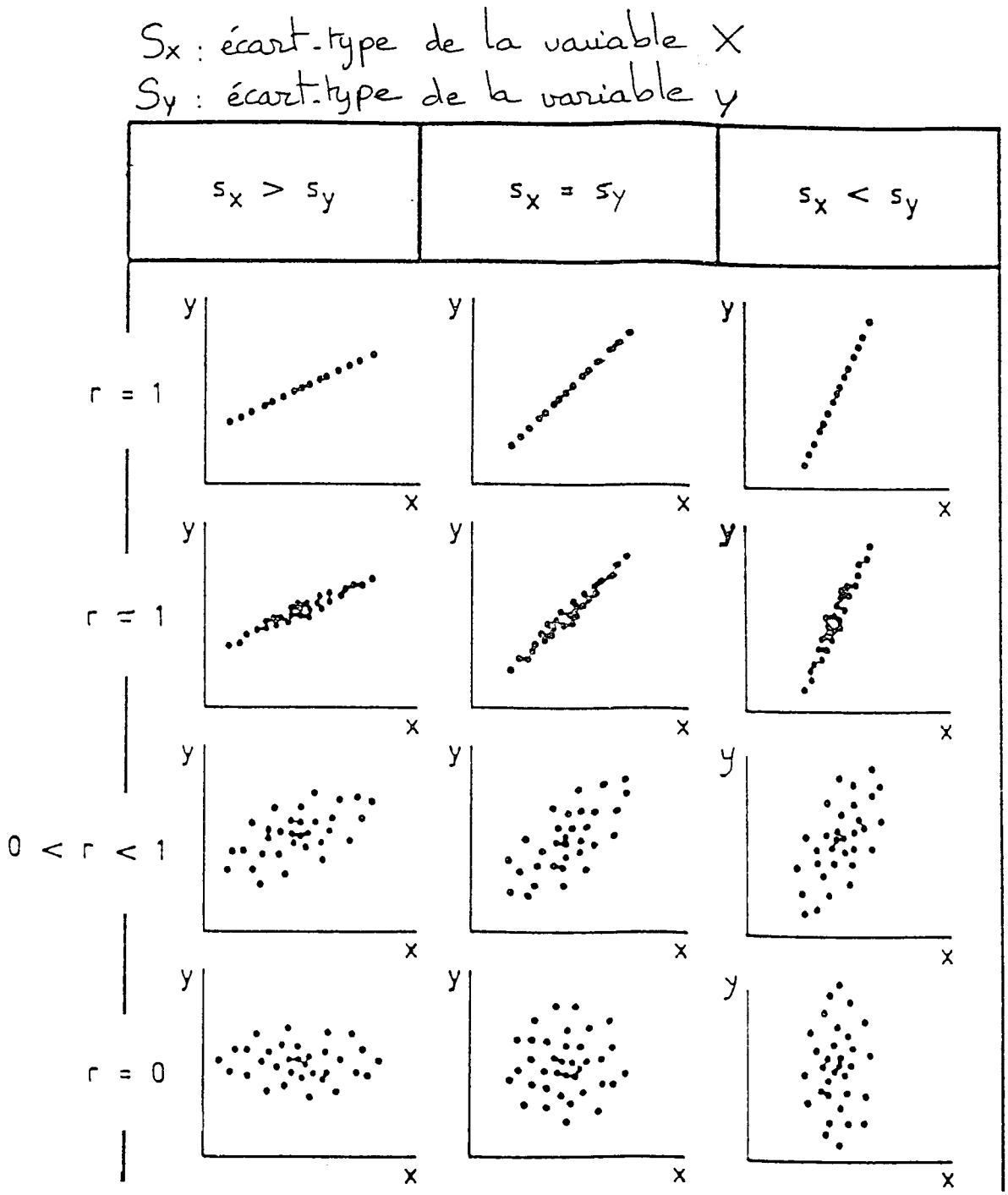
S est maximum si toutes les paires sont concordantes ; et avec n points : $S_{max} = n(n-1)/2$

Le coefficient τ est donné par : $\tau = S/S_{max}$

Liaison non lineaire

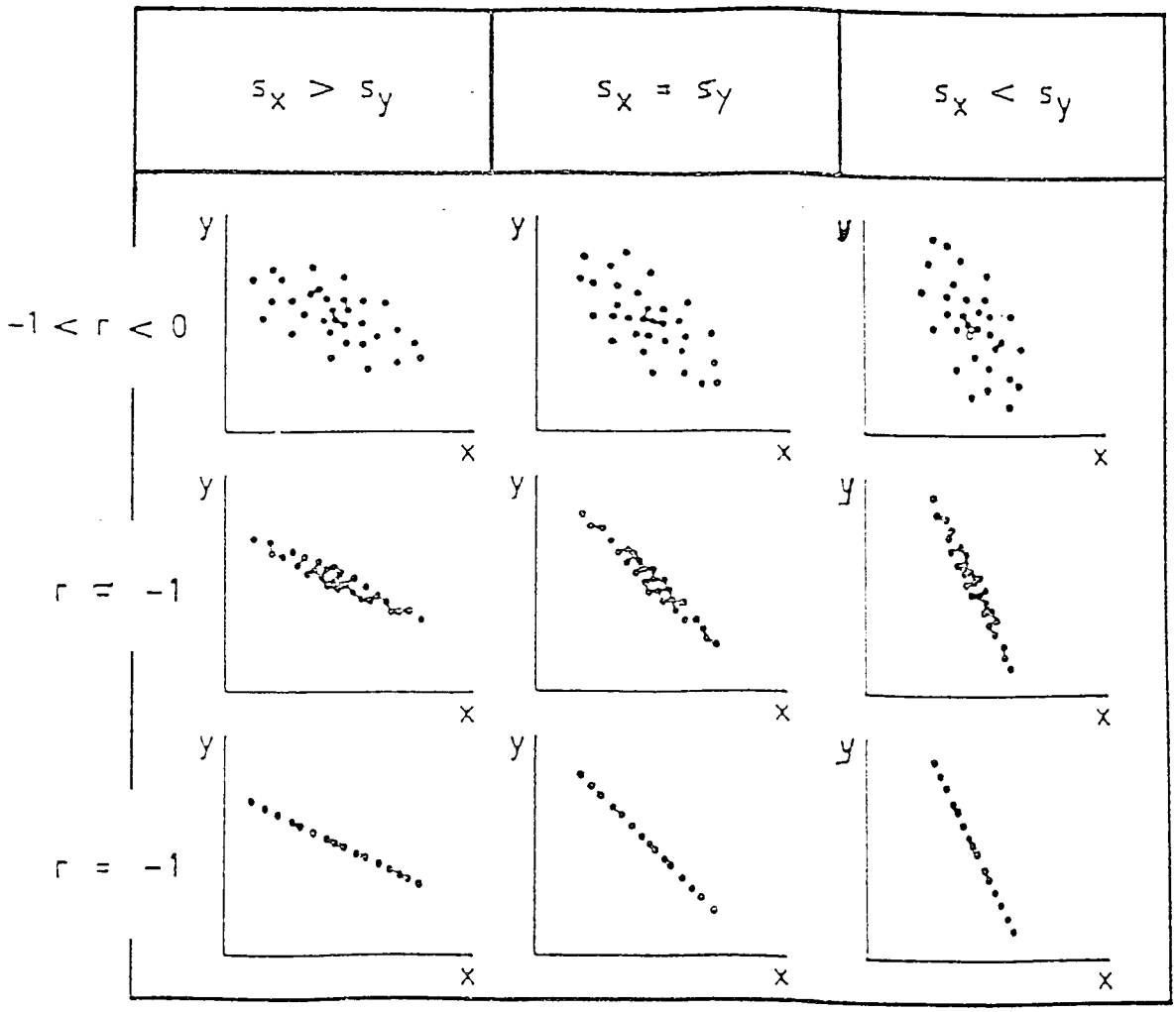


liaison linéaire entre 2 variables et corrélation r

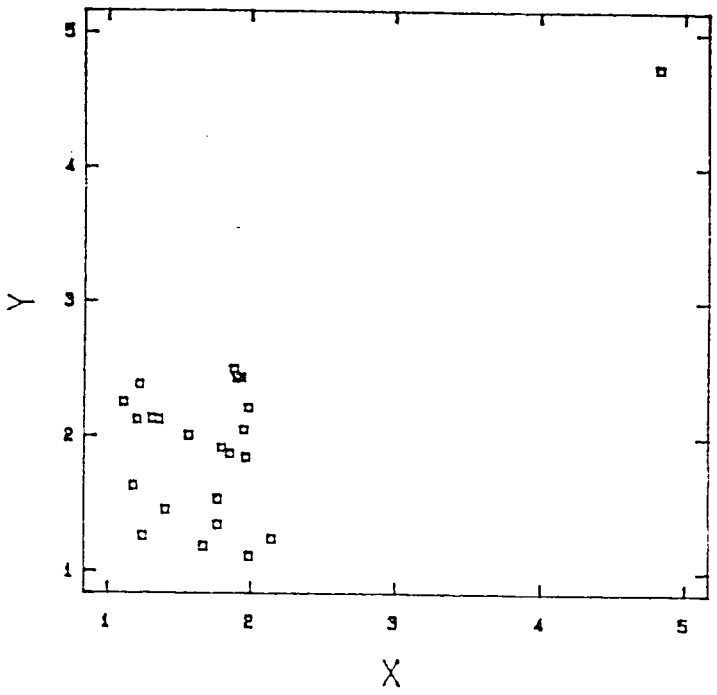


liaison linéaire entre 2 variables et corrélation r

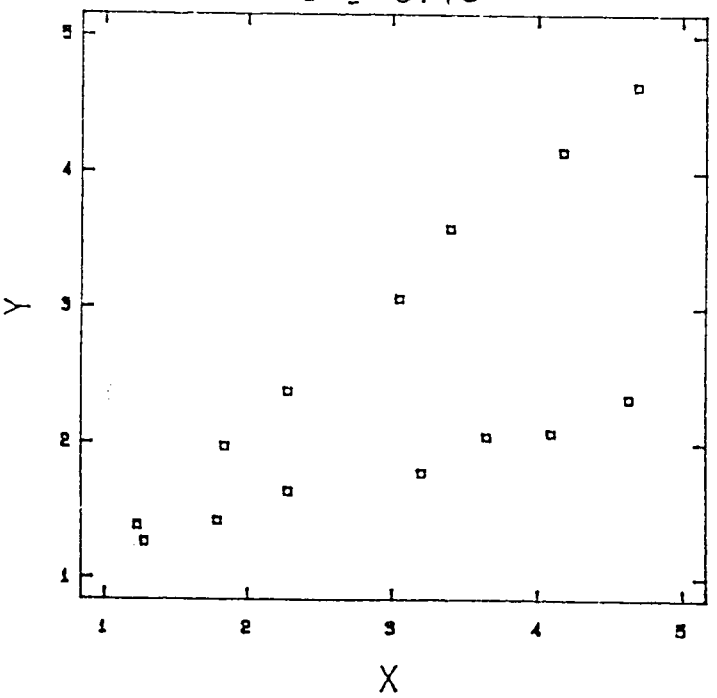
S_x : écart-type de la variable X
S_y : écart-type de la variable y



$\tau = 0.04$
$r_s = 0.02$
$r = 0.70$



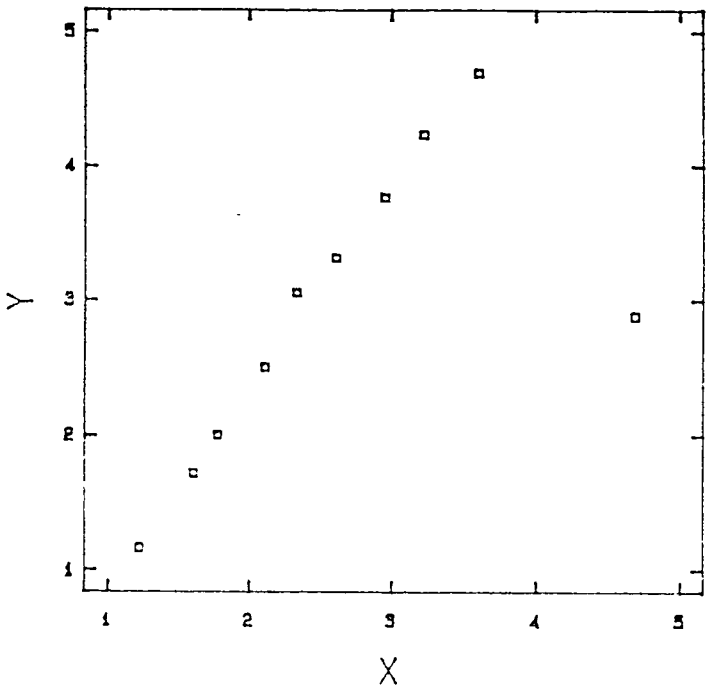
$\tau = 0.66$
$r_s = 0.78$
$r = 0.70$



$\tau = 0.78$

$\tau_S = 0.82$

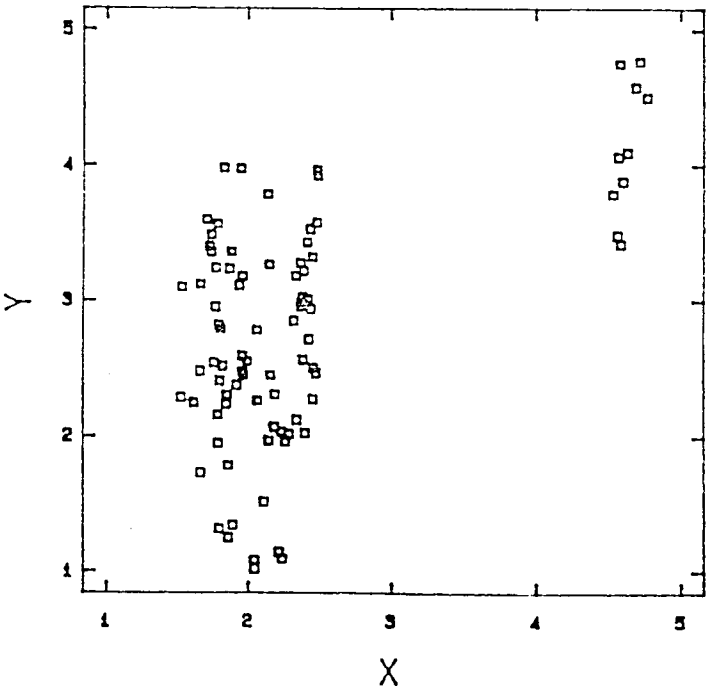
$r = 0.70$



$\tau = 0.32$

$\tau_S = 0.45$

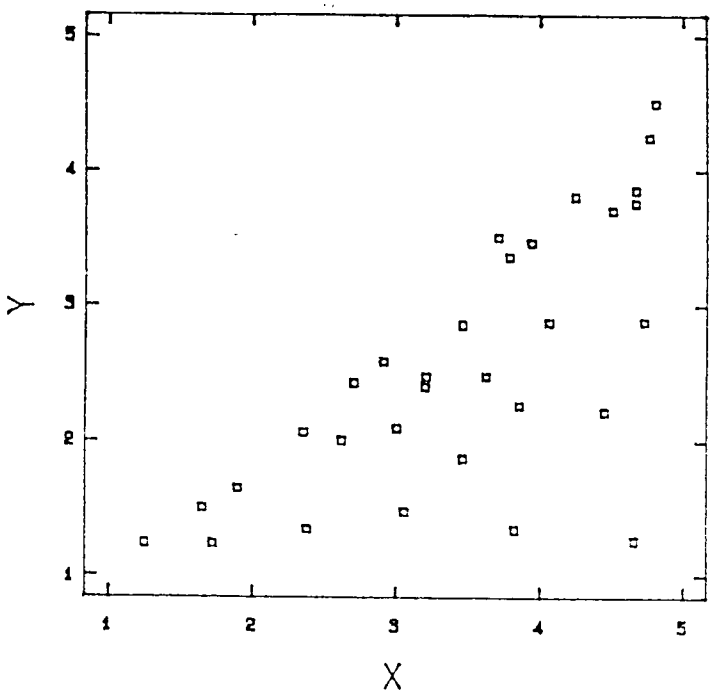
$r = 0.70$



$\tau = 0.57$

$r_S = 0.71$

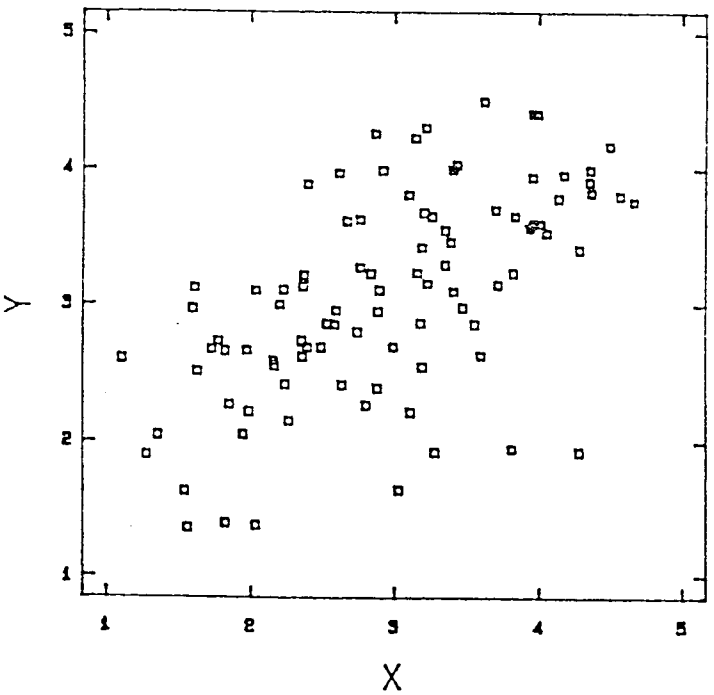
$r = 0.70$



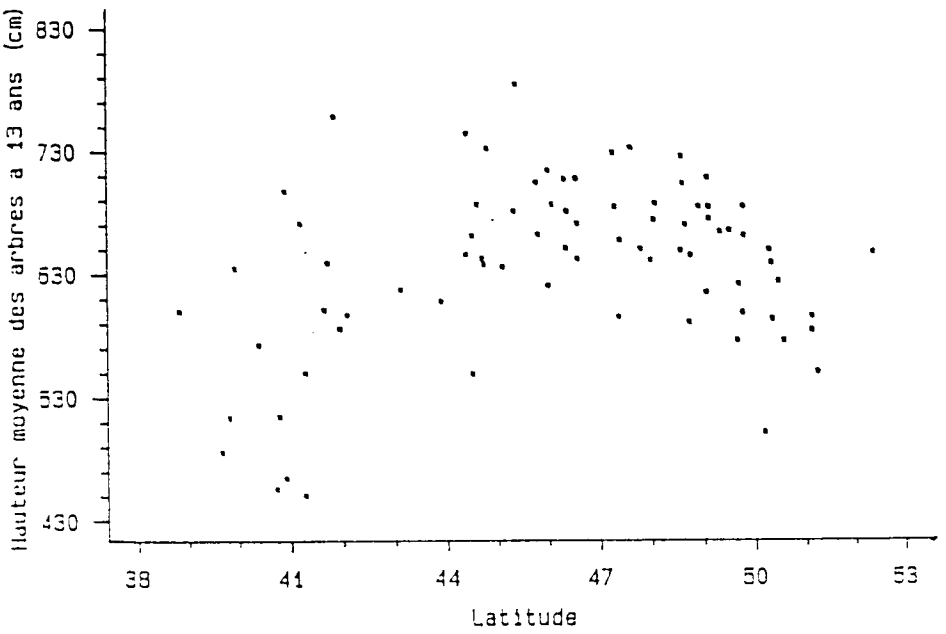
$\tau = 0.51$

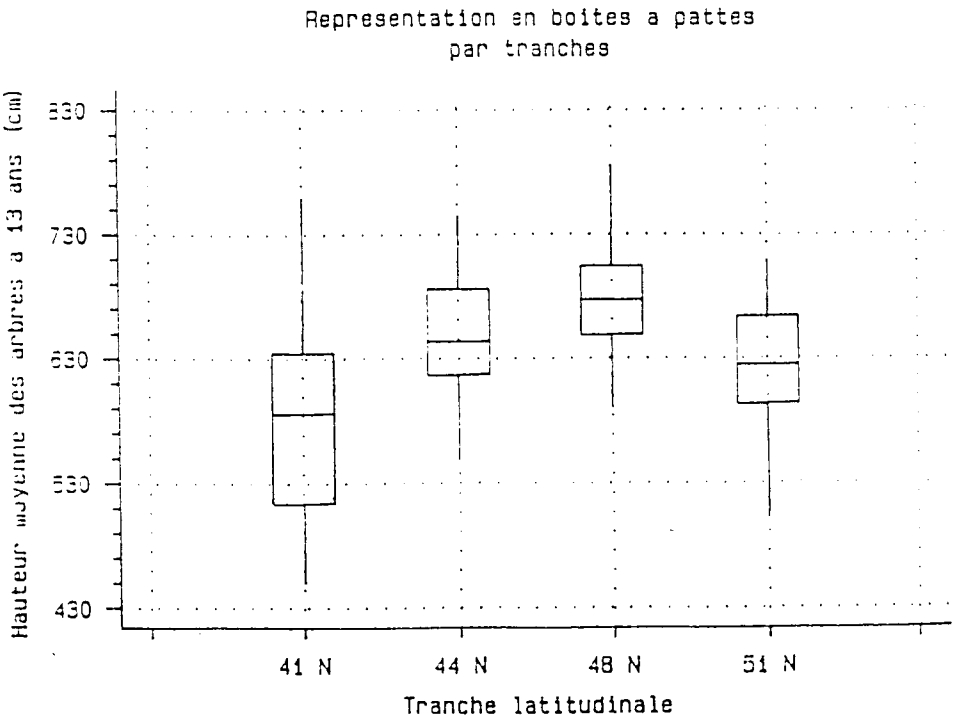
$r_S = 0.69$

$r = 0.70$

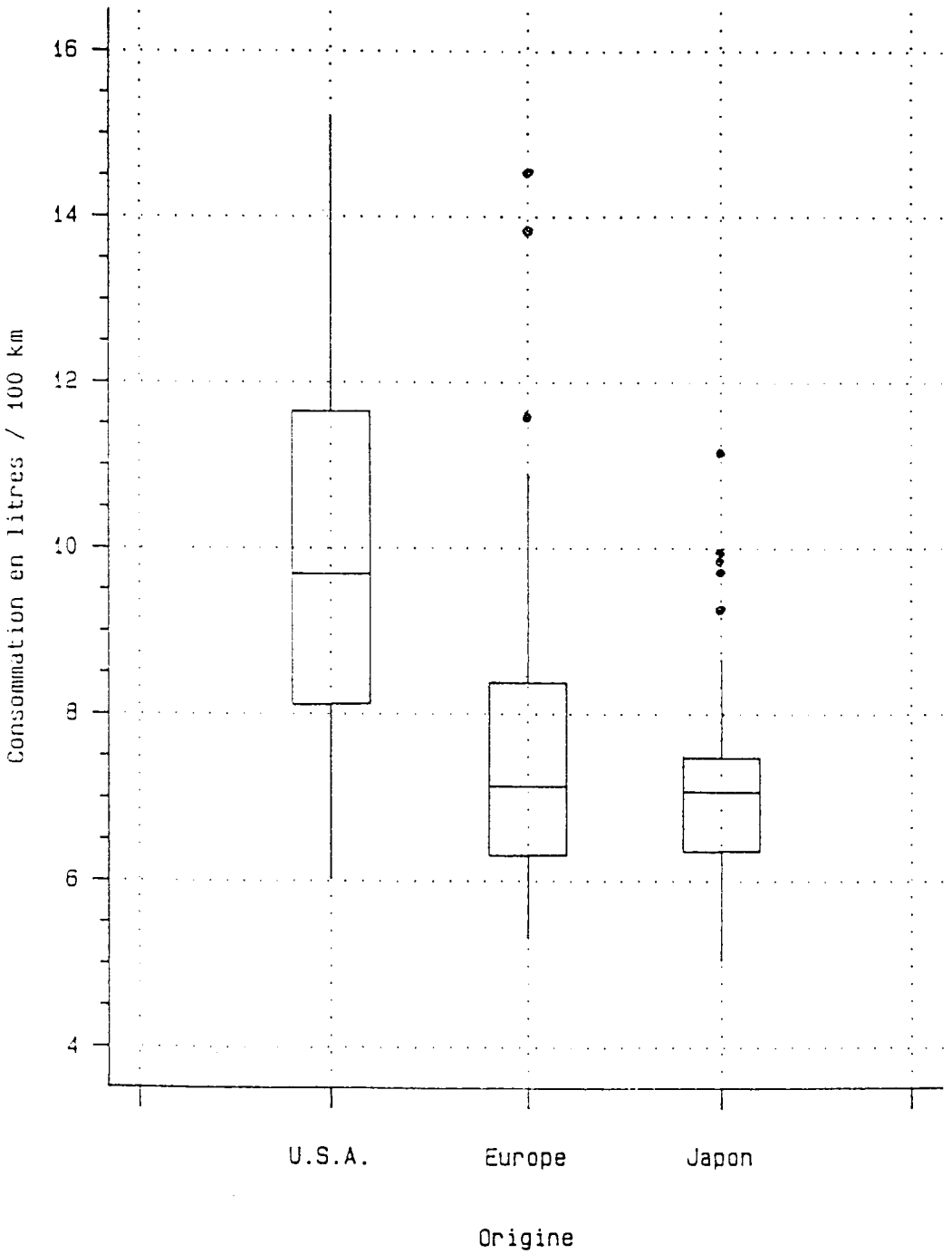


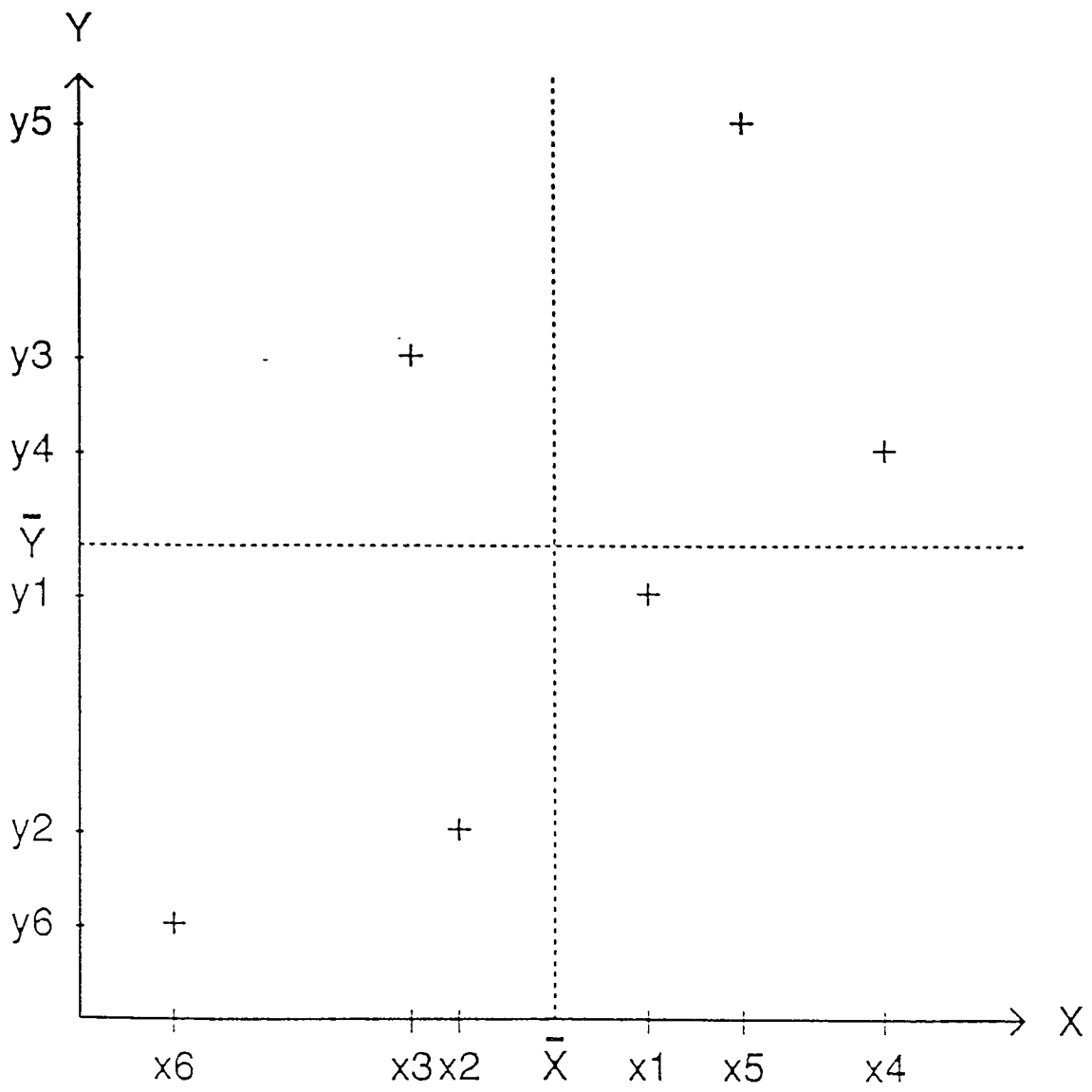
Liaison latitude d'origine - croissance en hauteur de provenances de Douglas

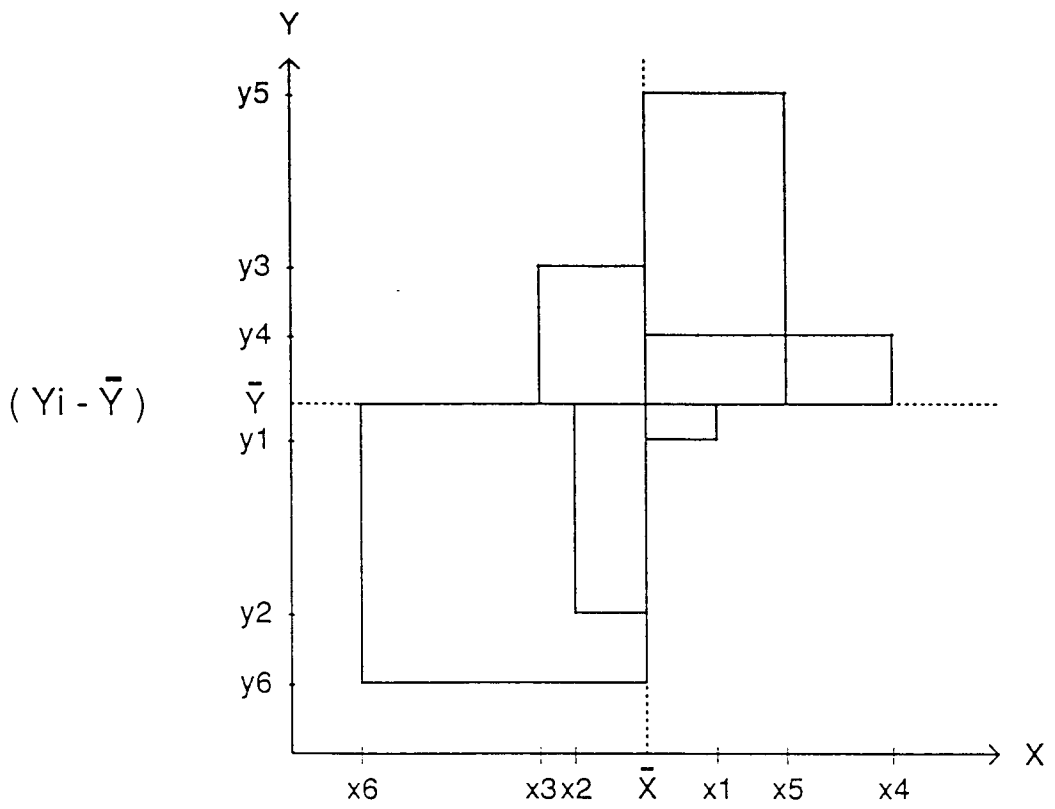




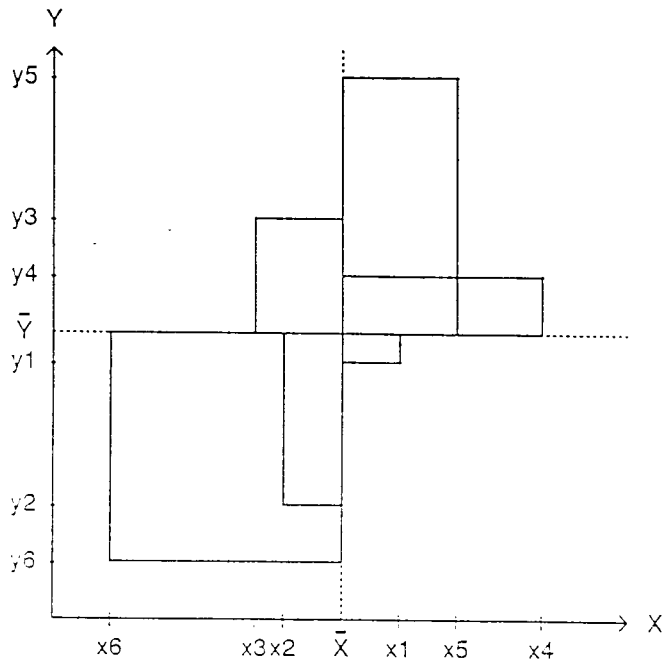
Relation entre la consommation des voitures et leur pays d'origine

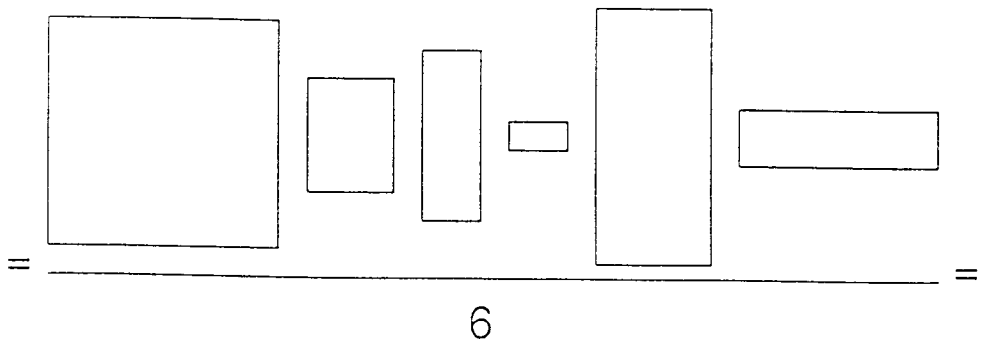



Y
y5
y3
y4
$\bar{Y}$
y1
y2
y6
X
x6
x3
x2
$\bar{X}$
x1
x5
x4



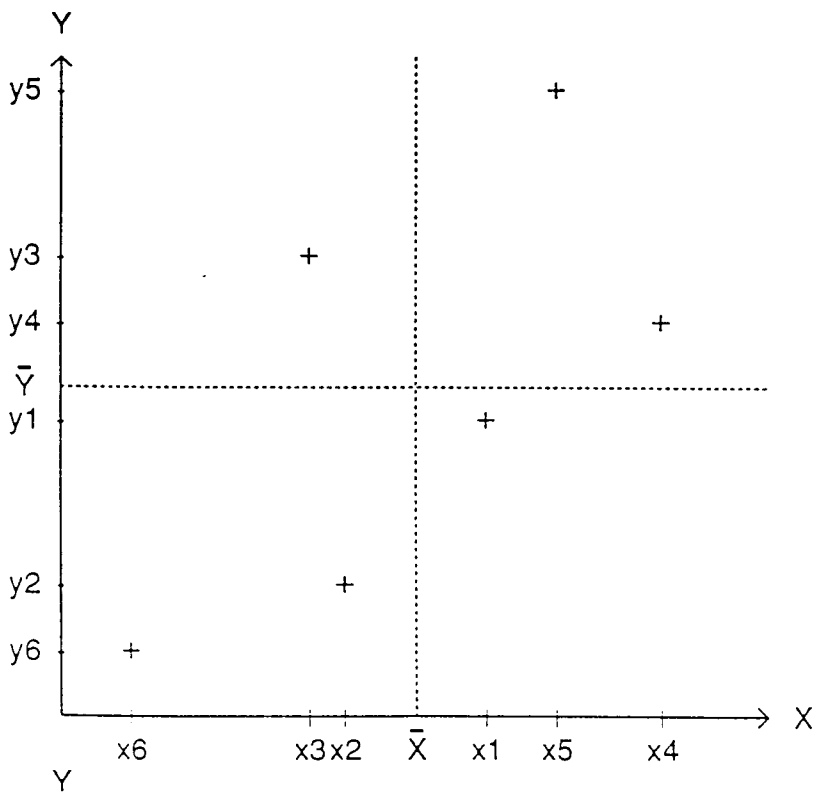
surface i = (Xi - $\bar{X}$) . (Yi - $\bar{Y}$)

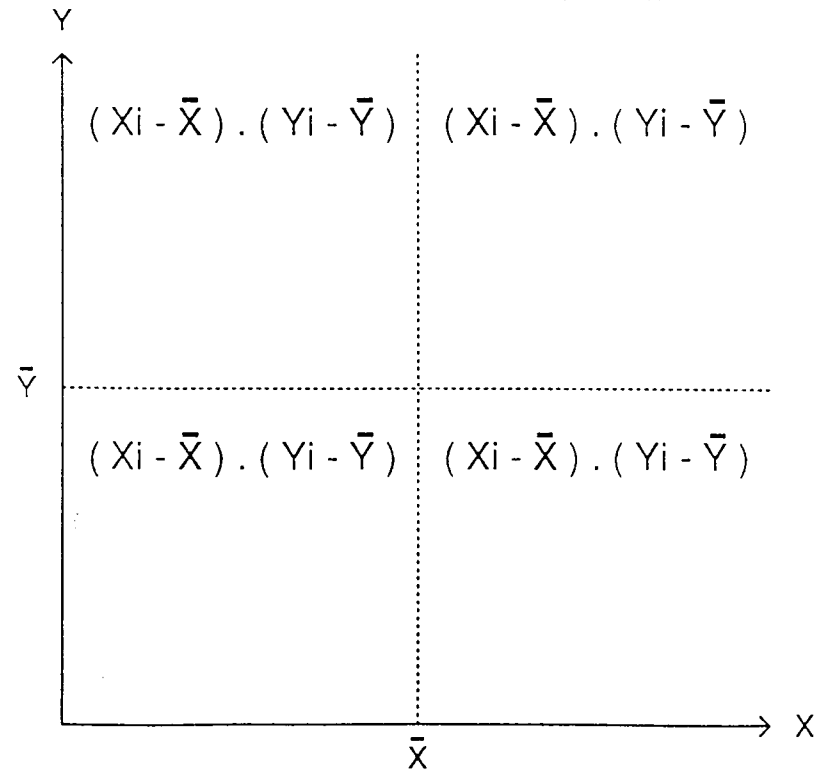


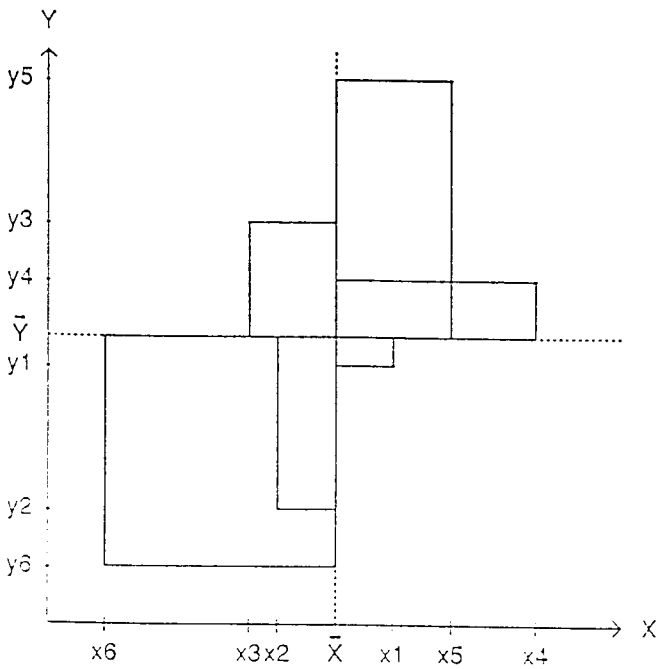


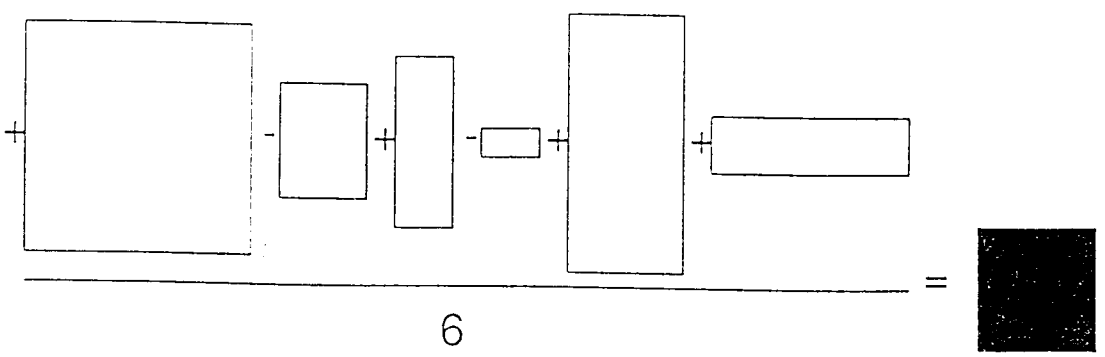
Dispositif Statistique

scénario 5


Y
y5
y3
y4
$\bar{Y}$
y1
y2
y6
X
x6
x3
x2
$\bar{X}$
x1
x5
x4


Y
$(Xi - \bar{X}) . (Yi - \bar{Y})$
$(Xi - \bar{X}) . (Yi - \bar{Y})$
$\bar{Y}$
$(Xi - \bar{X}) . (Yi - \bar{Y})$
$(Xi - \bar{X}) . (Yi - \bar{Y})$
X
$\bar{X}$





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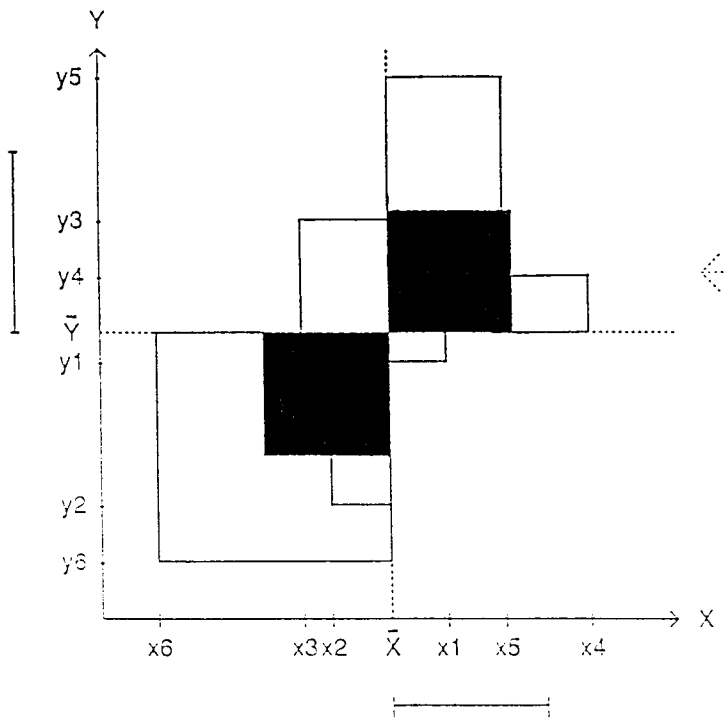

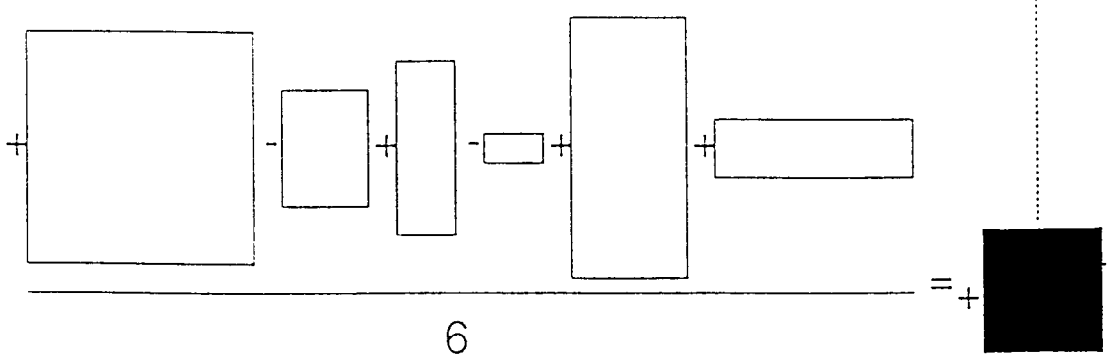

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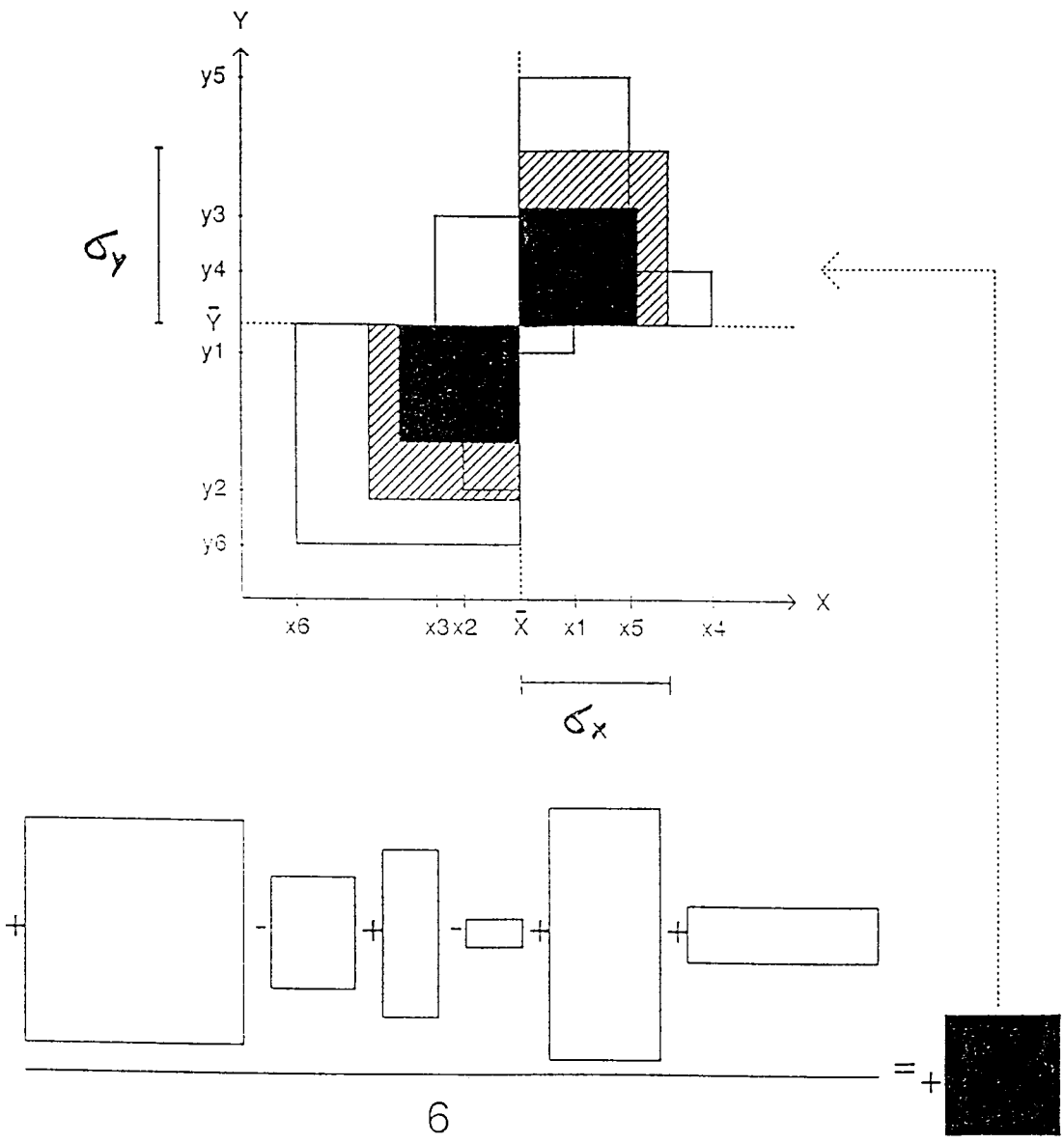
Y
y5
y3
y4
$\bar{Y}$
y1
y2
y6
σ_y
X
x6
x3 x2
$\bar{X}$
x1
x5
x4
σ_x
6