Genética Quantitativa (Eq Price):

→ Revisão:

$$E[X] = \bar{X} = \frac{\sum_{i=1}^{N} X_i}{N} = \sum_{i=1}^{N} f_i X_i$$

$c = \text{cte}$

$$E[X+Y] = E[X] + E[Y]$$

$$E[\overset{X+X}{2X}] = E[X] + E[X] = 2E[X]$$

$$E\big[E[X]\big] = E[X]$$

$$E[C] = C$$

$$\mathrm{Var}[X] = E[(X - \bar{X})^2] = E[(X - E[X])^2] =$$

$$= E[X^2 - 2\cancel{X}E[X] + E[X]^2] =$$

$$= E[X^2] - E[2XE[X]] + E[E[X]^2] =$$

$$= E[X^2] - 2E[XE[X]] + E[X]^2 =$$

$$= E[X^2] - 2\underbrace{E[X]E[X]}_{E[X]^2} + E[X]^2 =$$

$$= E[X^2] - E[X]^2$$

$$\mathrm{Cov}[X,Y] = E\left[(X-\bar{X})(Y-\bar{Y})\right] =$$

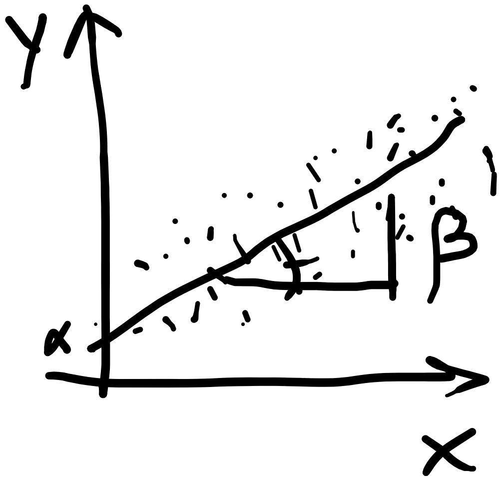
$$= E\left[(X-E[X])(Y-E[Y])\right] =$$

$$= E\left[XY - XE[Y] - YE[X] + E[X]E[Y]\right] =$$

$$= E[XY] - E\left[XE[Y]\right] - E\left[YE[X]\right] + E\left[E[X]E[Y]\right] =$$

$$= E[XY] - E[Y]E[X] - \cancel{E[X]E[Y]} + \cancel{E[X]E[Y]} =$$

$$= E[XY] - \underbrace{E[X]}_{\bar{X}}\,\underbrace{E[Y]}_{\bar{Y}} = E[XY] - \bar{X}\bar{Y}$$



$$Y = \alpha + \beta_{Y,X} X$$

$$Cov[X, Y] = Cov[X, \alpha + \beta_{Y,X} X] =$$

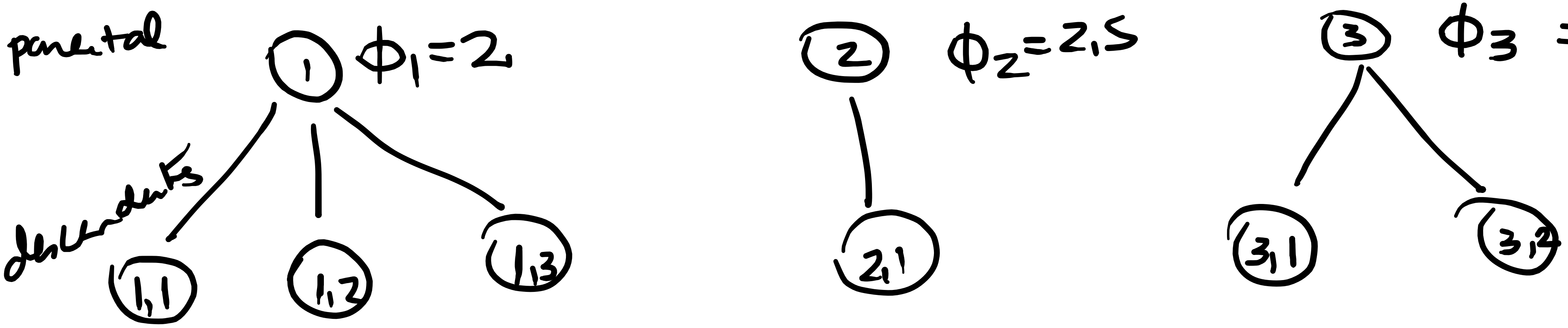
$$= E[X(\alpha + \beta X)] - E[X]\,E[\alpha + \beta X] =$$

$$= E[\alpha X + \beta X^2] - E[X](\alpha + \beta E[X]) =$$

$$= \cancel{\alpha E[X]} + \beta E[X^2] - \cancel{\alpha E[X]} - \beta E[X]^2 =$$

$$= \beta\left(E[X^2] - E[X]^2\right) = \beta Var[X]$$

→ Fenótipos – ϕ (caract mensuráveis)



$\phi_{1,1} = 2+0,5$ $\phi_{1,2} = 2-0,5$ $\phi_{1,3} = 2+0,2$ $\phi_{2,1} = 2.5-0,2$ $\phi_{3,1} = 2,7-0,1$ $\phi_{3,2} = 2,7+0,5$

$$\phi_{i,j} = \phi_i + \delta_{i,j}$$

Média da ger. parental $\overline{\phi}$ $= \dfrac{\sum_{i=1}^{N=3} \phi_i}{N} = \dfrac{2+2.5+2.7}{3} = 2.4$

Média de ϕ na ger. desc $\overline{\phi}$, : $\dfrac{2+0{,}5 + 2-0.5 + 2+0.2 + 2.5-0.2 + 2.7-0.1 + 2.7+0.5}{6}$

$w_1 = N^{o}$ filhos $1 = 3$

$w_2 = 1$ " $2 = 1$

$w_3 =$ " " $3 = 2$

$$= \frac{w_1 \cdot \overset{\phi_1}{2} + \overbrace{(0{,}5 - 0.5 + 0{,}2)}^{\delta_{1,j}} + w_2 \overset{\phi_2}{2.5} + \overbrace{(-0{,}2)}^{\delta_{2,j}} + w_3 \overset{\phi_3}{2{,}7} + \overbrace{(-0{,}1 + 0{,}5)}^{\delta_{3,j}}}{\sum_{i=1}^{N=3} w_i} =$$

$$= \frac{\sum_{i=1}^{N} w_i \phi_i + \sum_{j=1}^{w_1} \delta_{1,j} + \sum_{j=1}^{w_2} \delta_{2,j} + \sum_{j=1}^{w_3} \delta_{3,j}}{\sum_{i=1}^{N} w_i} =$$

$$= \frac{\sum_{i=1}^{N} w_i \phi_i + \sum_{i=1}^{N} \sum_{j=1}^{w_i} \delta_{i,j}}{\sum_{i=1}^{N} w_i} \quad ★$$

OBS:

$$\frac{\sum_{i=1}^{N} w_i}{N} = \bar{w} \rightarrow \underline{N\bar{w} = \sum_{i=1}^{N} w_i} \,//$$

$$\frac{\sum_{j=1}^{w_i} \delta_{ij}}{w_i} = \bar{\delta}_i \rightarrow \underline{w_i \bar{\delta}_i = \sum_{j=1}^{w_i} \delta_{ij}} \,//$$

$$\circledast \quad \bar{\phi}' = \frac{\sum_{i=1}^{N} w_i \phi_i + \sum_{i=1}^{N} \sum_{j=1}^{w_i} \delta_{ij}}{\sum_{i=1}^{N} w_i} = \frac{\sum_{i=1}^{N} w_i \phi_i + \sum_{i=1}^{N} w_i \bar{\delta}_i}{N \bar{w}} =$$

$$= \frac{1}{\bar{w}} \left[\frac{\sum_{i=1}^{N} w_i \phi_i}{N} + \frac{\sum_{i=1}^{N} w_i \bar{\delta}_i}{N} \right] =$$

$$\bar{\phi}' = \frac{1}{\bar{w}} \left[\underbrace{E[w\phi]} + E[w\bar{\delta}] \right] \quad \text{Eq Price}$$

$$\bar{\phi}' = \frac{1}{\bar{w}}\left[\underbrace{E[w\phi]} + E[w\bar{\delta}]\right] \qquad \ast$$

$$\mathrm{Cov}[w,\phi] = E[w\phi] - \overbrace{E[w]}^{\bar{w}}\,\overbrace{E[\phi]}^{\bar{\phi}}$$

$$E[w\phi] = \mathrm{Cov}[w,\phi] + \bar{w}\,\bar{\phi}$$

$$\ast \qquad \bar{\phi}' = \frac{1}{\bar{w}}\left[\mathrm{Cov}[w,\phi] + \bar{w}\,\bar{\phi} + E[w\bar{\delta}]\right] =$$

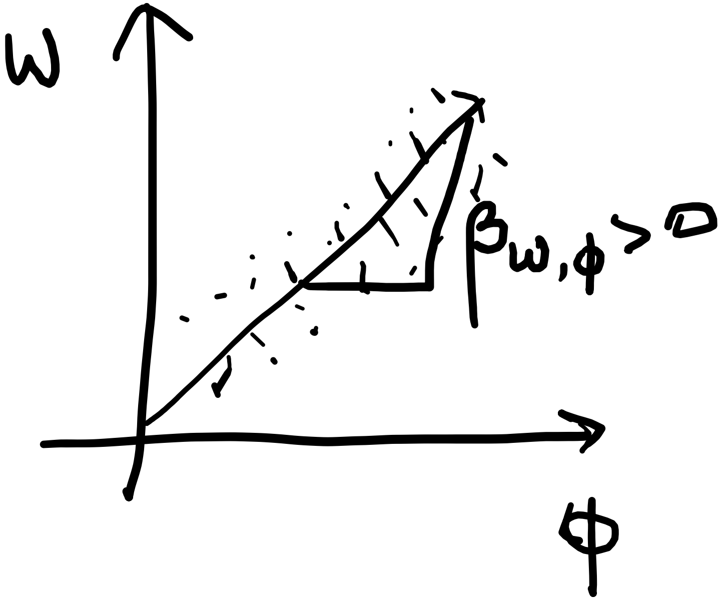
$$= \frac{1}{\bar{w}}\left[\mathrm{Cov}[w,\phi] + E[w\bar{\delta}]\right] + \bar{\phi}$$

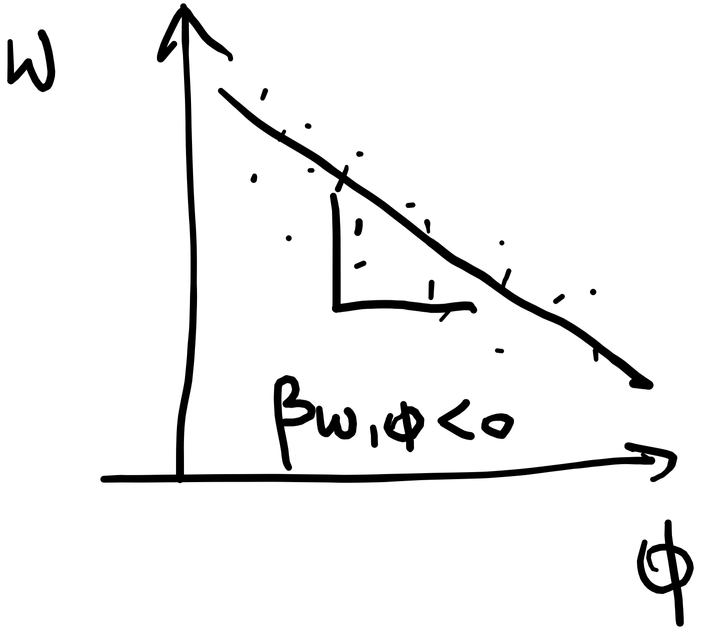
$$\bar{\phi}' - \bar{\phi} = \frac{1}{\bar{w}}\left[\mathrm{Cov}[w,\phi] + E[w\bar{\delta}]\right]$$

Eq Price

$$\Delta\bar{\phi} = \frac{1}{\bar{w}}\Big[\underbrace{\mathrm{Cov}[\overset{\text{fitness}}{w},\overset{\text{característica}}{\phi}]}_{\text{SN}} + \underbrace{E[w\bar{\delta}]}_{\text{processos que envolvem a reprodução}}\Big]$$

$\frac{1}{\bar{w}}\mathrm{Cov}[w,\phi]$ diferencial de seleção





$$Cov[w,\phi] = \beta_{w,\phi} Var[\phi]$$

direcionalidade

$$\Delta\bar{\phi} = \frac{1}{\bar{w}}\left[Cov[w,\phi] + \cancelto{0}{E[w\bar{\delta}]}\right]$$

$$\Delta\bar{\phi} = \frac{1}{\bar{w}}\beta_{w,\phi} Var[\phi]$$

$\Delta\bar{\phi} > 0$ (carct $\uparrow$) $\beta_{w,\phi} > 0$

$\Delta\bar{\phi} < 0$ (carct $\downarrow$) $\beta_{w,\phi} < 0$

$\beta_{w,\phi} = 0 \rightarrow \Delta\bar{\phi}$

$$\Delta \bar{\phi} = \frac{1}{\bar{w}} \left[Cov[w, \phi] + E[w\bar{\delta}] \right]$$

Eq Price

$$\phi \to (\phi - \bar{\phi})^2$$

Subst de variância

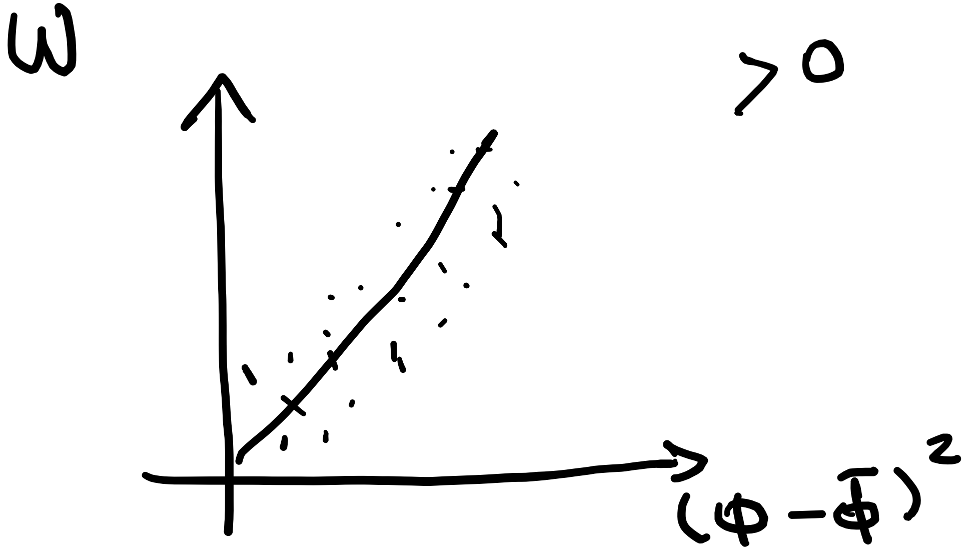
$$\Delta E[\phi] = \frac{1}{\bar{w}} \left[Cov[w, \phi + E[w\bar{\delta}] \right]$$

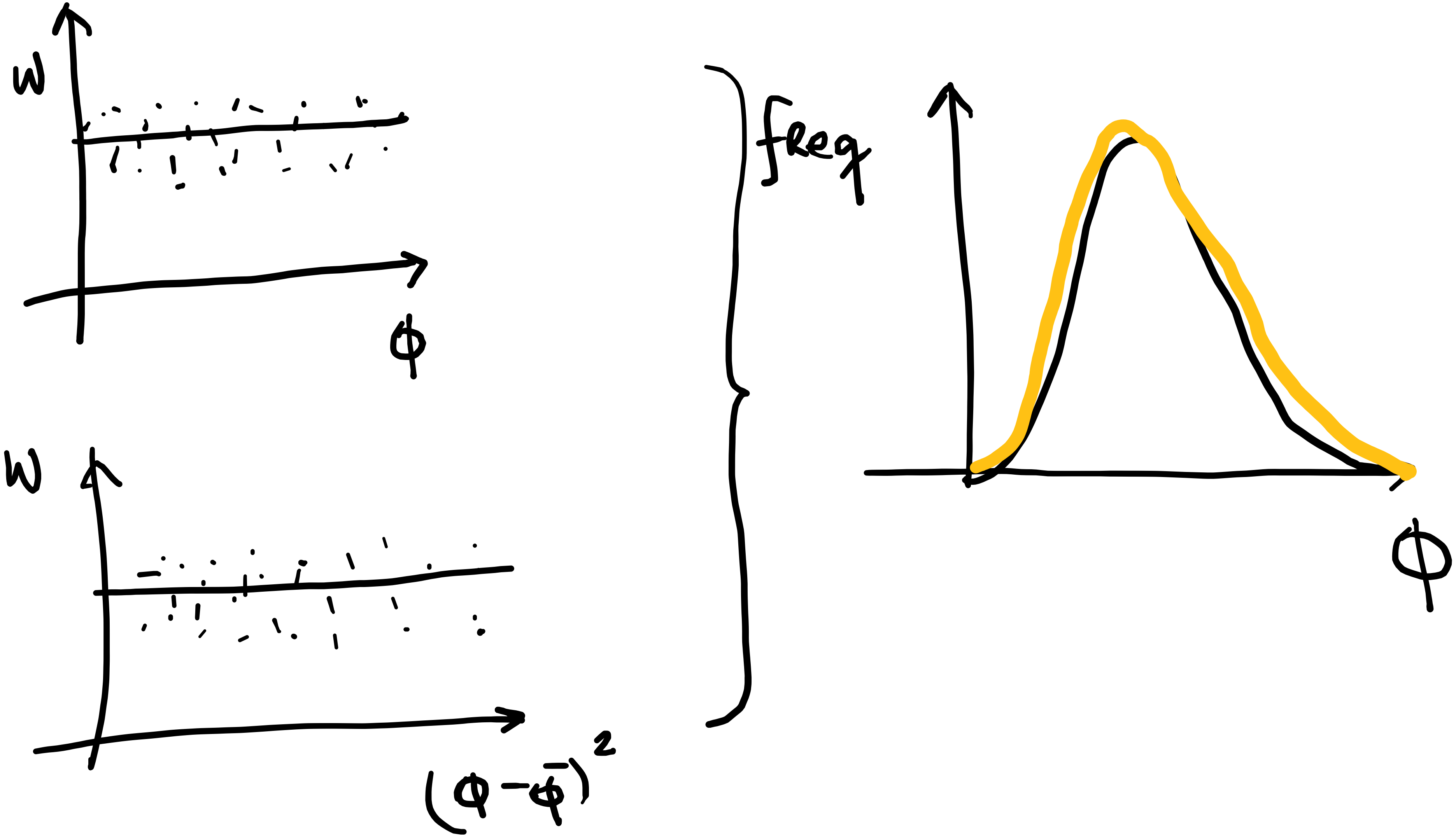
$$\Delta E[(\phi - \bar{\phi})^2] = \frac{1}{\bar{w}} \left[Cov[w, (\phi - \bar{\phi})^2] + E[w\bar{\delta}_{(\phi - \bar{\phi}^2}] \right] =$$

$$\Delta Var[\phi] = \frac{1}{\bar{w}} \left[Cov[w, (\phi - \bar{\phi})^2] + \cancel{E[w\bar{\delta}]} \right] \quad 0$$

$$\Delta \mathrm{Var}[\phi] = \frac{1}{\bar{w}}\left[\underbrace{\mathrm{Cov}\left[w, (\phi - \bar{\phi})^2\right]}\right]$$

$$\Delta \mathrm{Var}[\phi] = \underbrace{\frac{1}{\bar{w}}}_{>0}\ \underbrace{\beta_{w,(\phi-\bar{\phi})^2}}_{\substack{>0 \to \mathrm{Var}\,\phi\,\uparrow \\ <0 \to \mathrm{Var}\,\phi\,\downarrow}}\ \underbrace{\mathrm{Var}\left[(\phi - \bar{\phi})^2\right]}_{>0}$$

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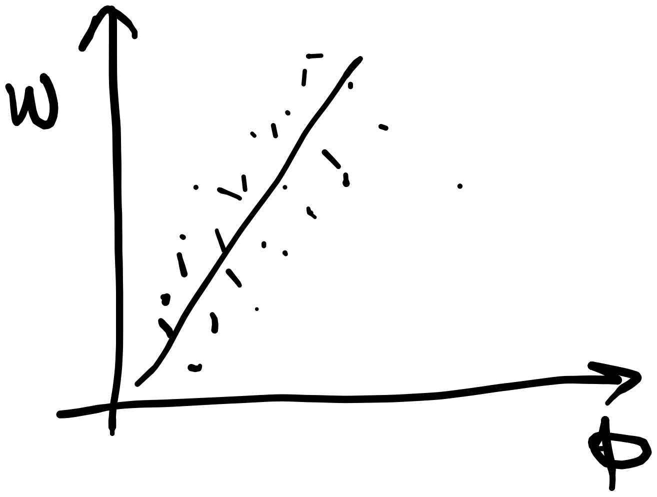

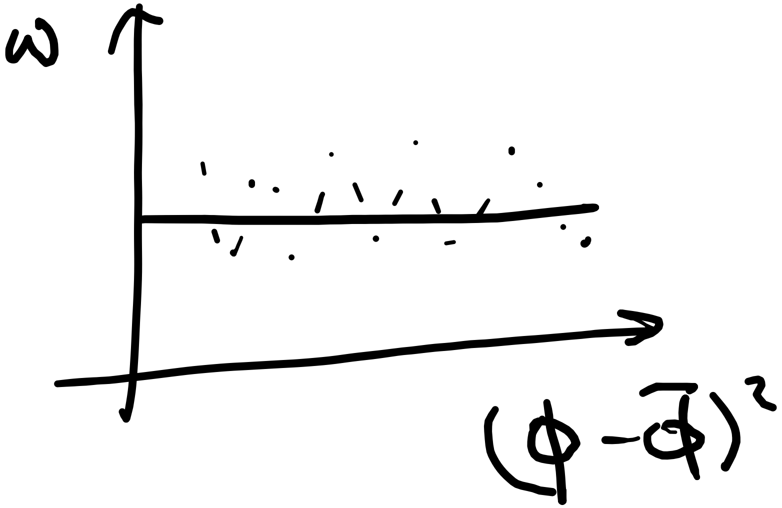

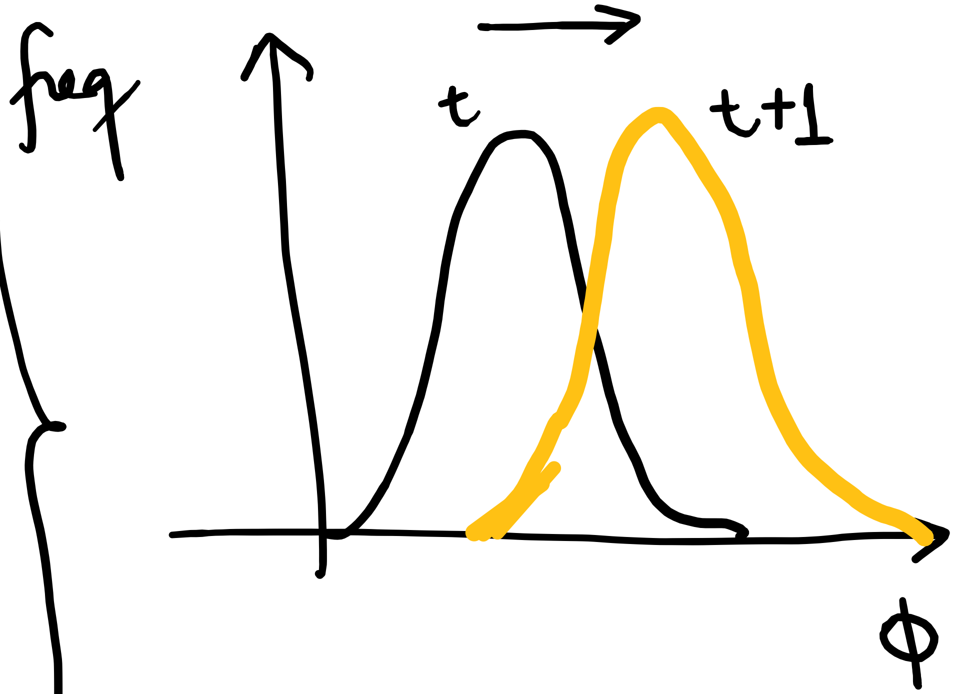

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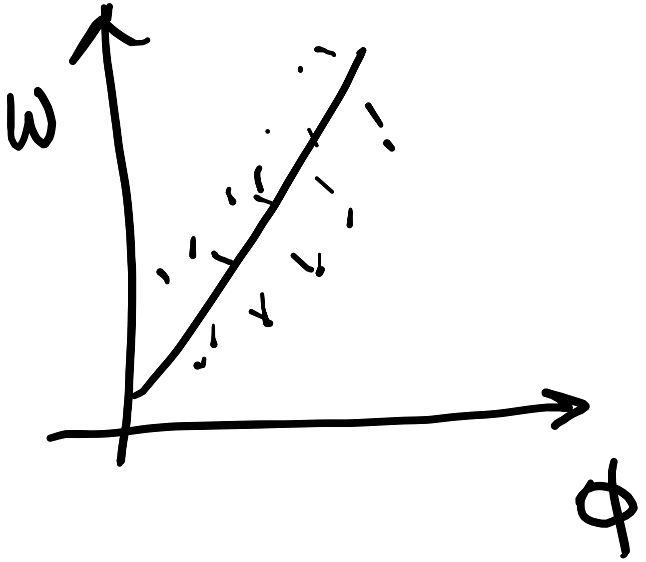
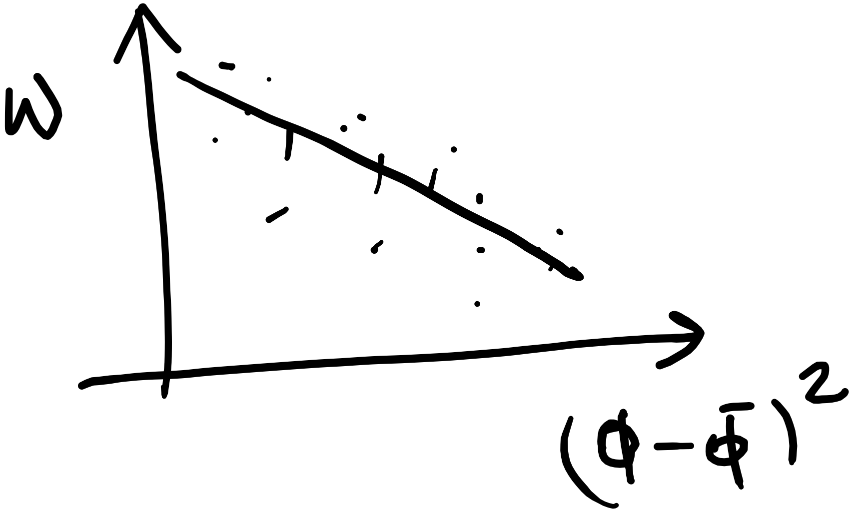
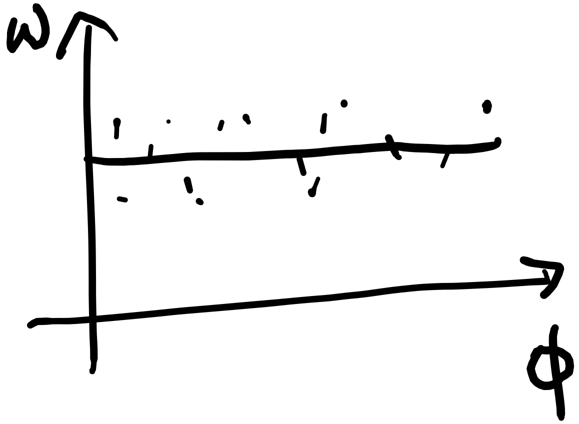
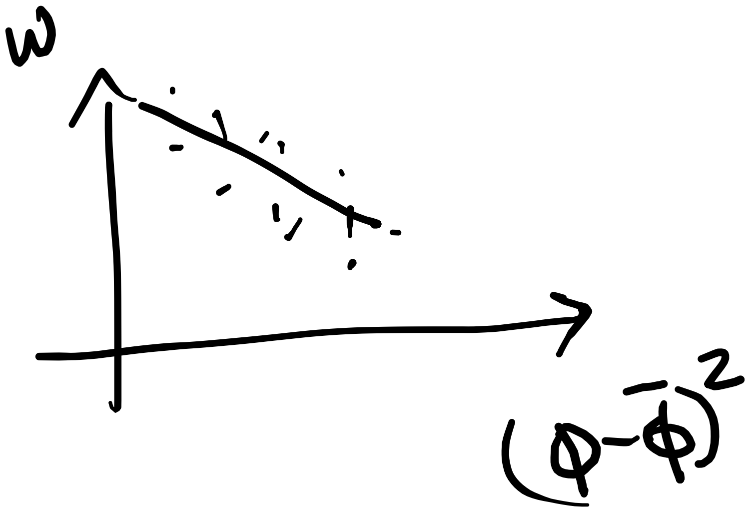


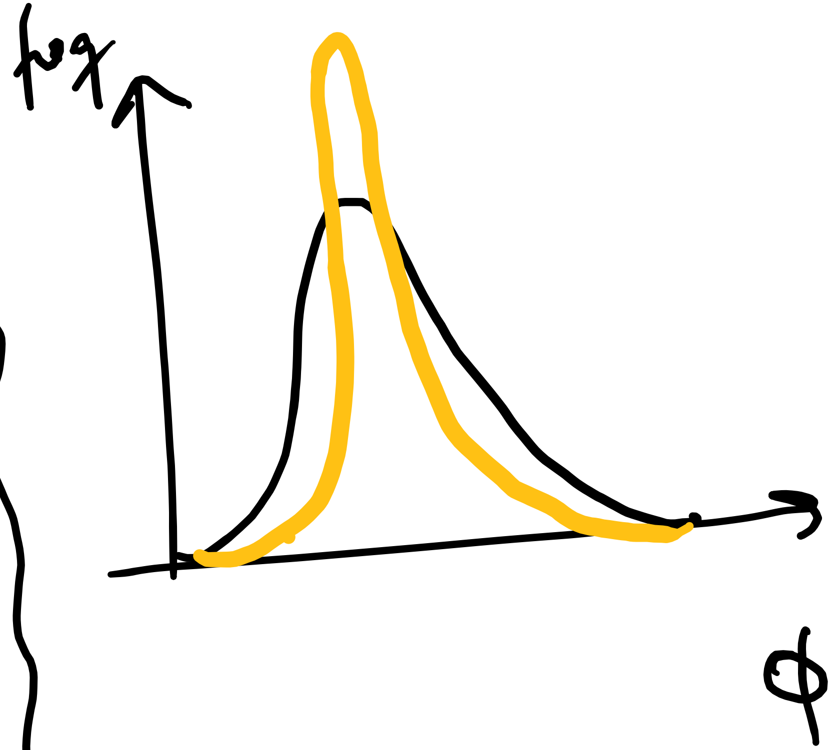


sel. direcional

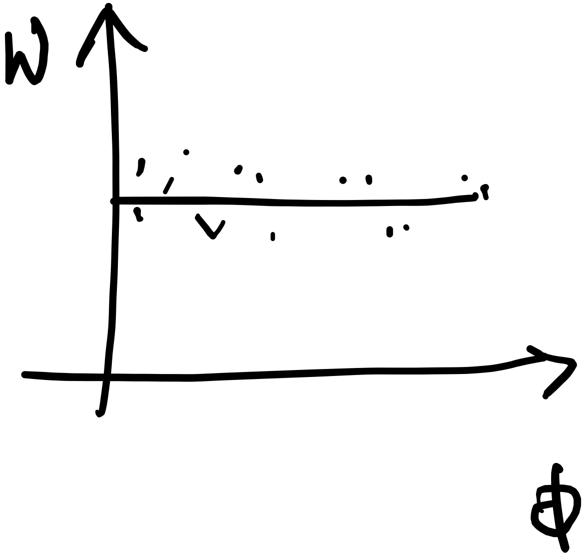
sel. estabilizadora

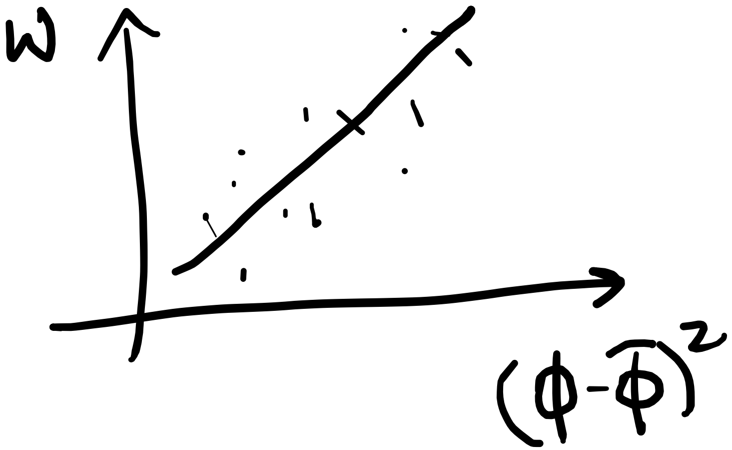


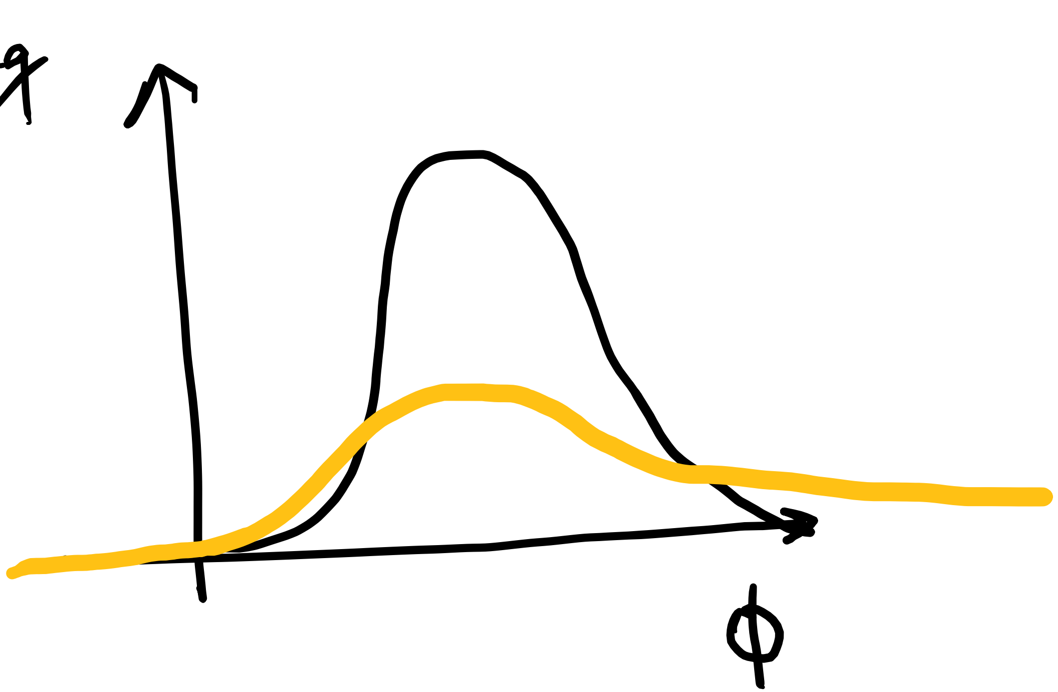




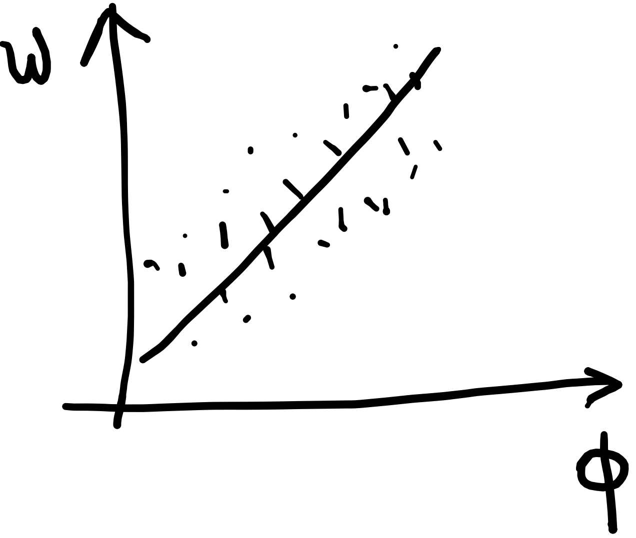
Sel. estabilizadora

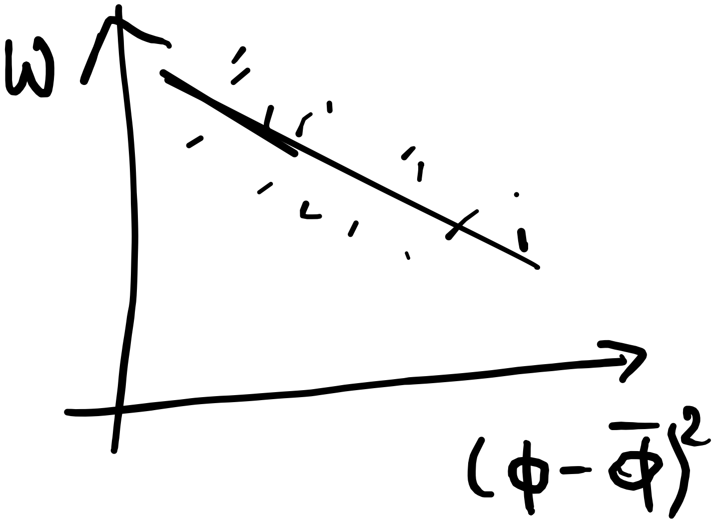


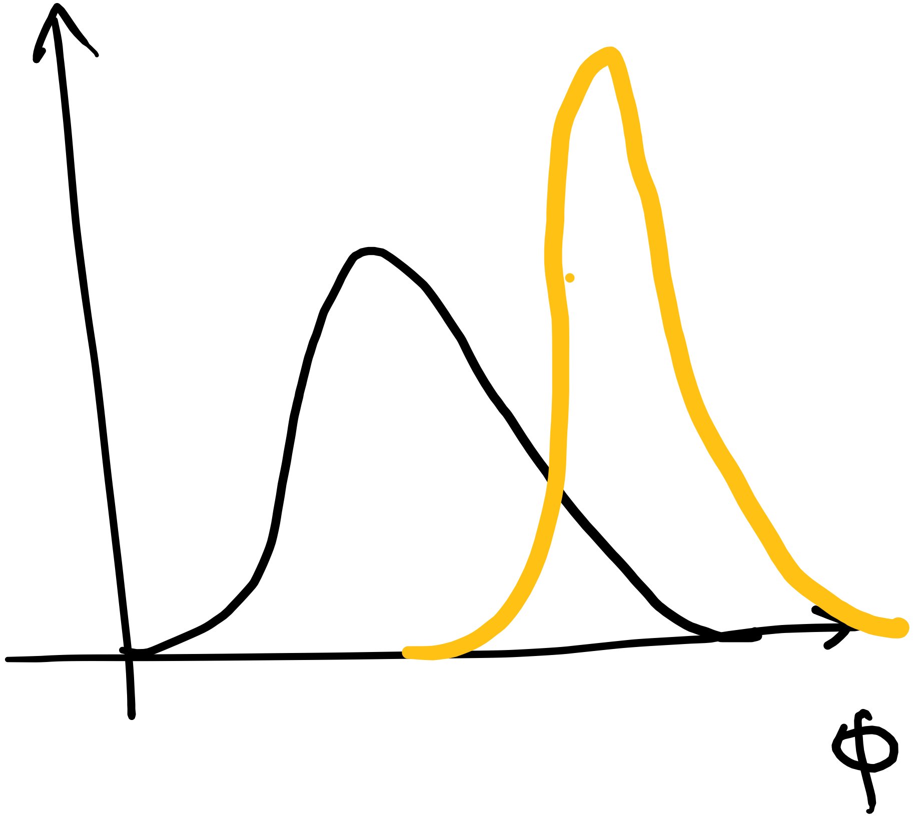




sel disruptiva







sel estabilizadora

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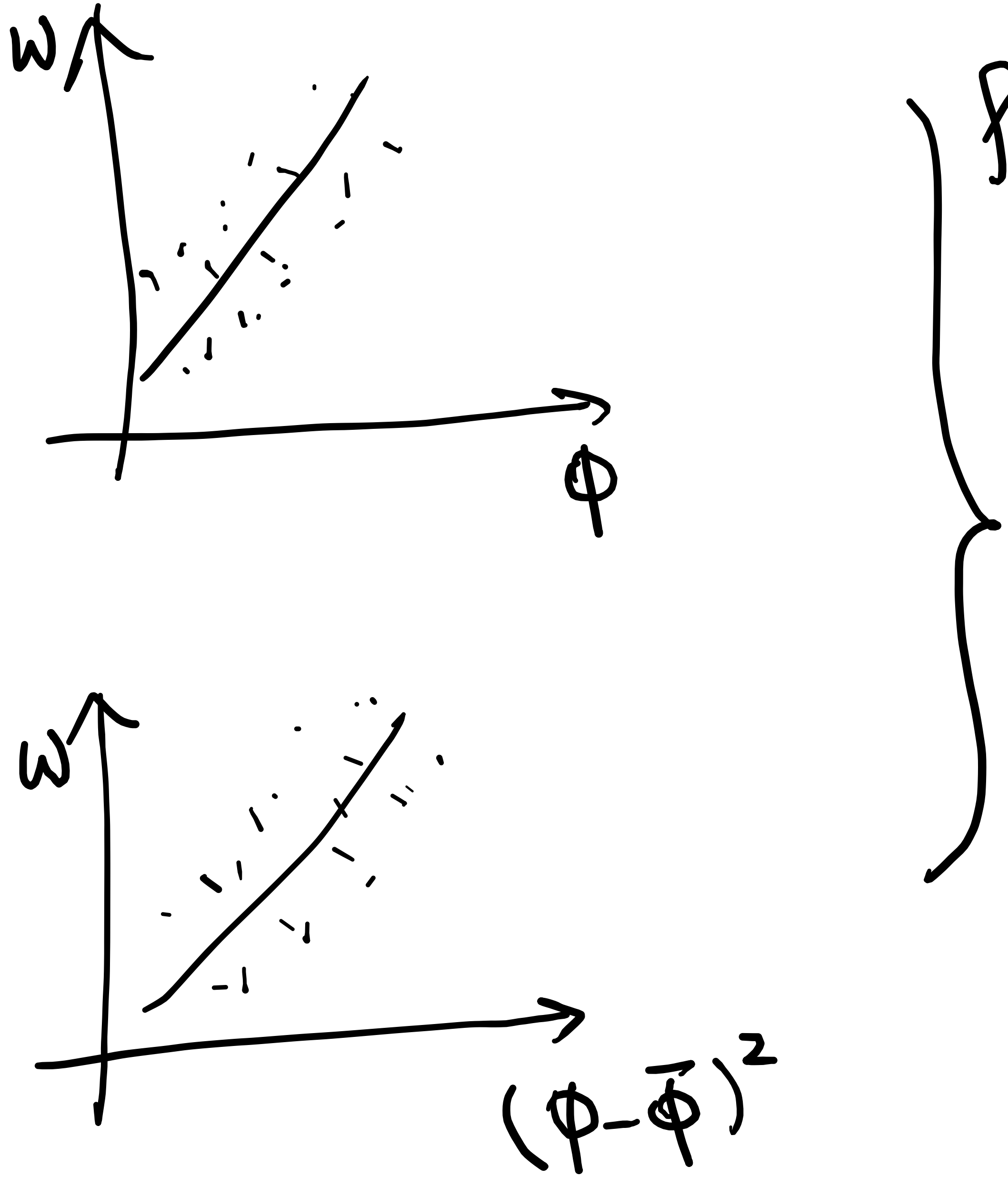

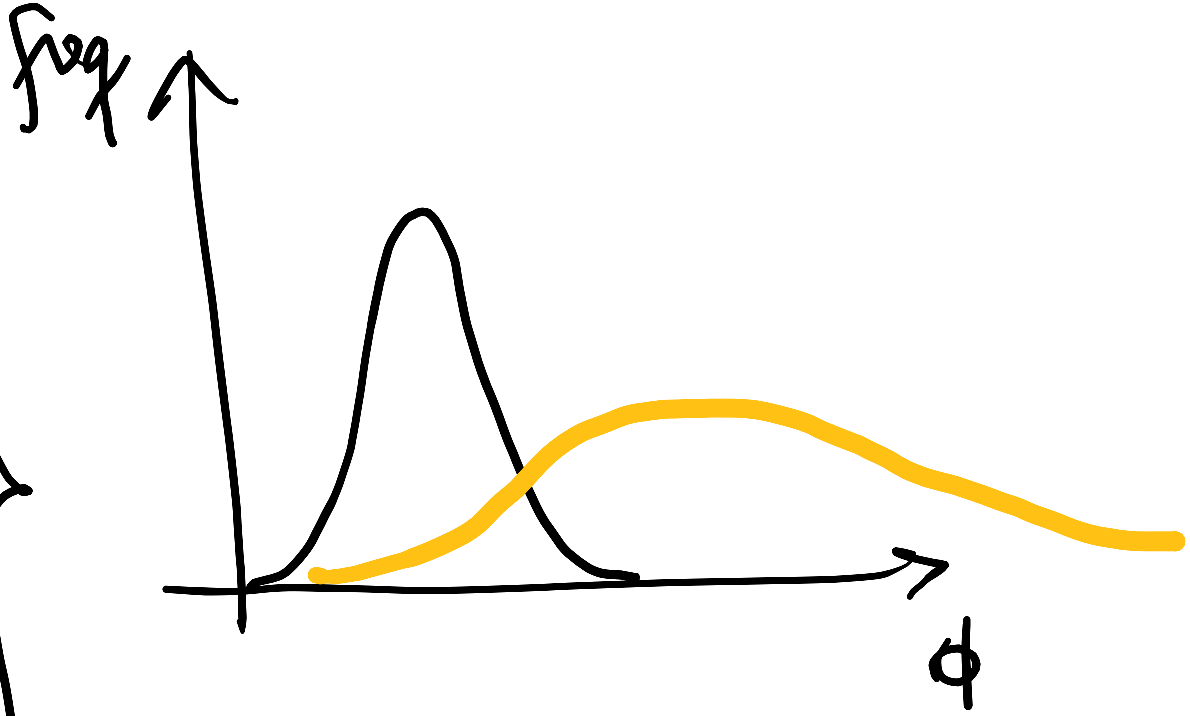

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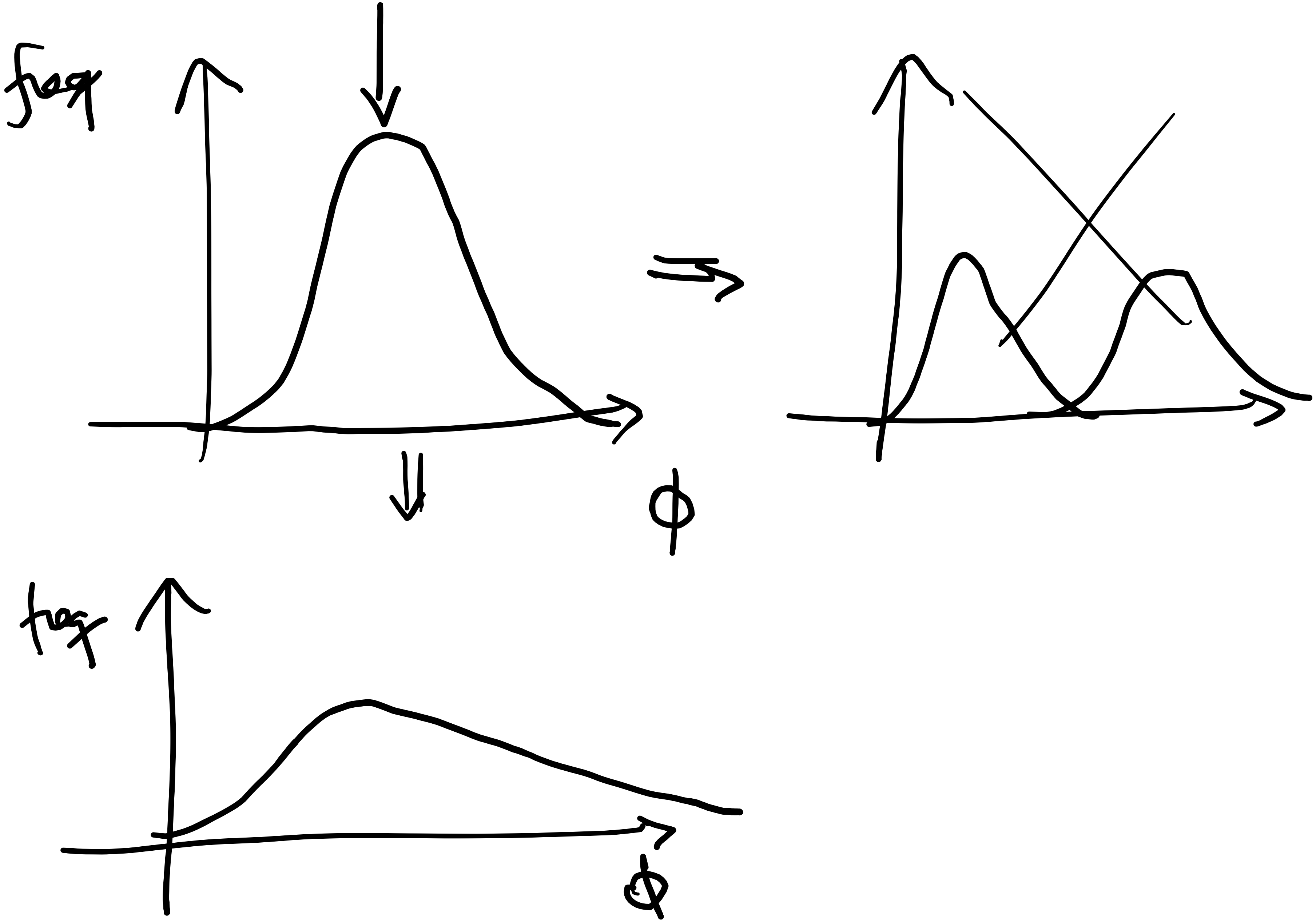
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