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- Ejercicios Tema 1:

1. { Gasto eléctrico: 56800€ / Gasto medio: 55300€ / Desv. típica: 2100€ } ⇒ X: Gasto de cadena [N ~ (55300, 2100²)]

a) $P[X < 56800] = P\left[Z < \frac{56800 - 55300}{2100}\right]$;

$P[Z < 0'7142]$ ⇒ Si buscamos en la tabla N(0,1) tenemos 0'71 ⇒ **0'7611**

b) 

$P_{86} \Rightarrow z_{0'86} \Rightarrow 1'08\%$

$X = \mu + zV$;

$P_{86} = 55300 + 1'08 \cdot 2100 = 57568€$;

* No pertenece

c) $P_{25} = z_{0'25} = -0'67$

$P_{25} = 55300 - 0'67 \cdot 2100 = 53893€$

56800 - 53893 = 2907€ tendría que reducir

$800 = \mu - 0'67\alpha$; $1000 = \mu + 1'176\alpha$;

$-800 = -\mu + 0'67\alpha$

$1000 = \mu + 1'176\alpha$

$200 = 1'845\alpha$; $\alpha = 108'4010$

$\mu = 800 + 0'67 \cdot 108'4010 \Rightarrow$ **872'62**

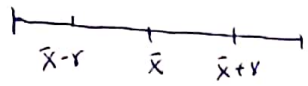
3. a)

Desigualdad de Chebyshev

$$P(\bar{x} - r < x < \bar{x} + r) \geq \frac{1 - \text{Var}(x)}{r^2}$$

$\{ \text{Var} = 64\ €^2;\ r = 20; \}$

$$1 - \frac{64}{20^2} \Rightarrow \boxed{0'84}$$



~~P => 0'16 => Probabilidad~~

P => 0'84 => Probabilidad

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b) $S^2 = 64$; $S = 8$; Media => 200 €

$180 = 200 + 8\alpha_1$; $\Rightarrow \alpha_1 = -2'5$

$220 = 200 + 8\alpha_2$; $\Rightarrow \alpha_2 = 2'5$

$-2'5 < p < 2'5$

- Pasamos a distribución Normal:

$z_{-2'5} = 0'0062$

$z_{2'5} = 0'9938$

$\boxed{0'0062 < p < 0'9938}$ Cota;

$0'9938 - 0'0062 \Rightarrow \boxed{0'9876} \Rightarrow$ Probabilidad;

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4. $B(\overbrace{1200}^{n}, \overbrace{0'05}^{p})$

$\{ \mu = n \cdot p \Rightarrow 1200 \cdot 0'05 \Rightarrow 60$

$\sigma^2 = 60 \cdot (1 - 0'05) = 57$; $\sigma = \sqrt{57} = 7'5498 \}$

$X \sim N(60, 7'5498)$;

$P[X > 45] = 1 - P[X \leq 45] = 1 - (-1'9868) \Rightarrow 1 - 0'0233 = \boxed{0'9767}$

* Convertimos

$B(100, 0'05) \Rightarrow \{ \mu = n \cdot p = 100 \cdot 0'05 = 5$

$\sigma^2 = 5 \cdot (1 - 0'05) = 4'75 \Rightarrow \sigma = \sqrt{4'75} = 2'1794 \}$

$X \sim N(5, 2'1794)$

$P[X < 6] \Rightarrow \frac{6 - 5}{2'1794} = \overset{Z}{0'45588315} \Rightarrow \boxed{0'6772}$

* Probabilidad de que acepte.