1] $X \sim N(6, 2)$ $\boxed{\text{Llista 3}}$

$\mu = 6$ $\sigma^2 = 2$ $\sigma = \sqrt{2}$

a] $P(X < 5) = P\left(\frac{X-6}{\sqrt{2}} < \frac{5-6}{\sqrt{2}}\right)$

$= P\left(Z < -\frac{1}{\sqrt{2}}\right) = 1 - P\left(Z < \frac{1}{\sqrt{2}}\right)$

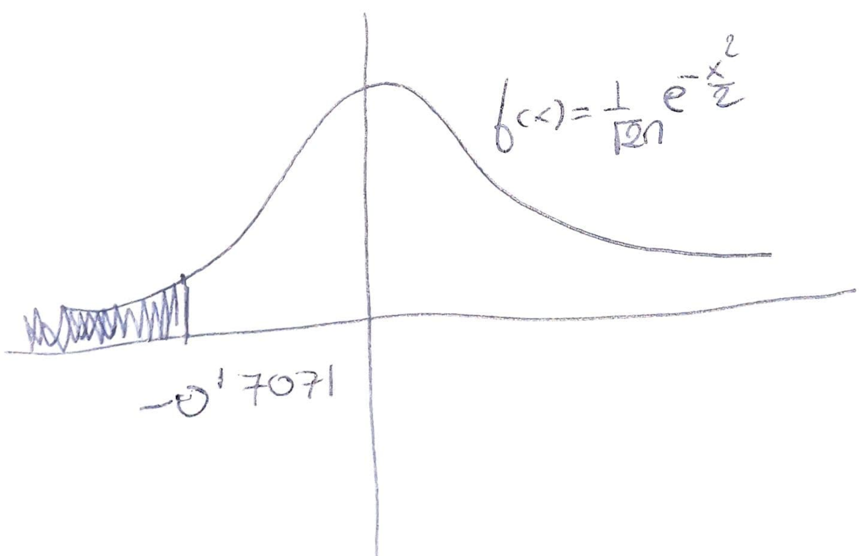
$= 1 - \text{pnorm}(0'7071)$

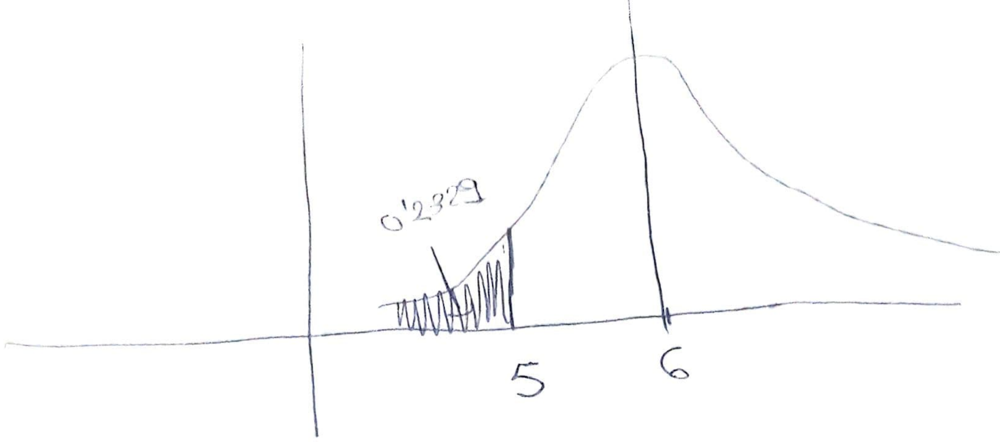
$= 1 - 0'7602478 = \boxed{0'2397522}$

Directament:

$P(X<5) = \text{pnorm}(5, 6, \text{sqrt}(2))$

$= \boxed{0'2329522}$





b)

$$P(X < a) = 0'2$$

$$P\left(\frac{X-6}{\sqrt{2}} < \frac{a-6}{\sqrt{2}}\right) = 0'2$$

$$P\left(Z < \frac{a-6}{\sqrt{2}}\right) = 0'2$$

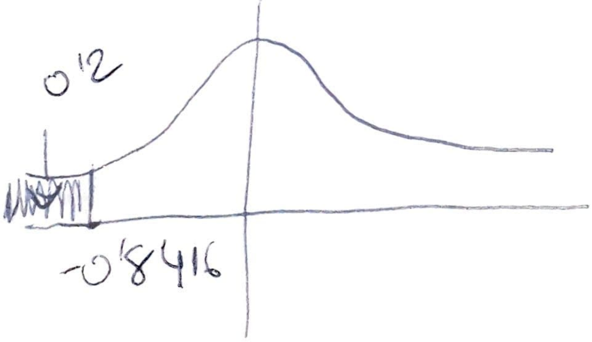
qnorm(0'2) = −0'8416

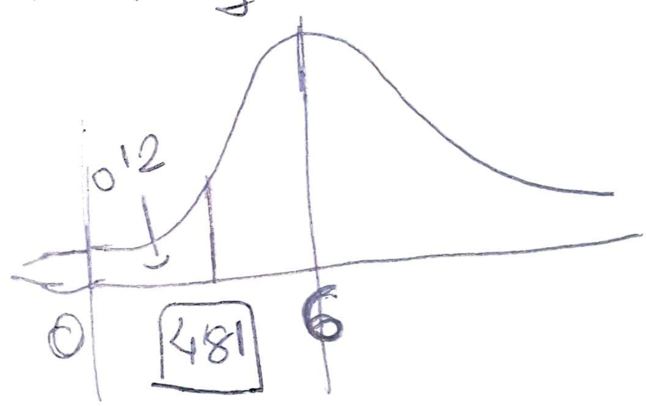
$$-0'8416 = \frac{a-6}{\sqrt{2}}$$

$$a = -0'8416\sqrt{2} + 6$$
$$= \boxed{4'81}$$

Directament:

qnorm(0'2, 6, sqrt(2)) = $\boxed{4'81}$





2]

$X \sim N(\mu = 69, \sigma^2 = 36)$

$S_4 \sim N(69 \cdot 4, 36 \cdot 4)$

$\mu_S = 276$

$\sigma^2_S = 144 \rightarrow \sigma_S = 12$

$P(S_4 < a) = 0'9$

$a = \text{qnorm}(0'9, 276, 12)$

$= 291'3786$

Altraforma: $\text{qnorm}(0'9) = 1'28\,1552$.

$a = 1'281552 \cdot 12 + 276$

$= 291'3786.$

3] $X \sim N(170, 49)$

$Y \sim N(160, 36)$

$aX + bY \sim N(a\mu_1 + b\mu_2, a^2\sigma_1^2 + b^2\sigma_2^2)$

$P(X > Y) = P(X - Y > 0) = 1 - P(X - Y \leq 0)$

$= 1 - \text{pnorm}(0, 10,$ $\text{sqrt}(85$

$X - Y \sim N(10, 49+36)$

pn

$= 1 - \text{pnorm}\left(-\frac{10}{\sqrt{85}}\right.$

$= 1 - 0'13\,903$

$= \boxed{0'86\,09}$

4]

$X \sim N(1200, 400)$

$\overline{X} \sim N\left(\mu, \frac{\sigma^2}{n}\right)$

$N\left(1200, \frac{400}{n}\right)$

$P(\overline{X} \geq 1180) \geq 0'98$

$P(\overline{X} < 1180) \leq 0'02$

$\text{qnorm}(0'02) = -2'0537$

$-2'0537 \cdot \sqrt{\frac{400}{n}} + 1200 = 1180$

$2'0537 \cdot \frac{20}{\sqrt{n}} = 20$

$\frac{2'0537}{\sqrt{n}} = 1$

$\sqrt{n} = 2'0537$

$n = (2'0537)^2 = 4'2176\,84$

$\boxed{n \simeq 5}$