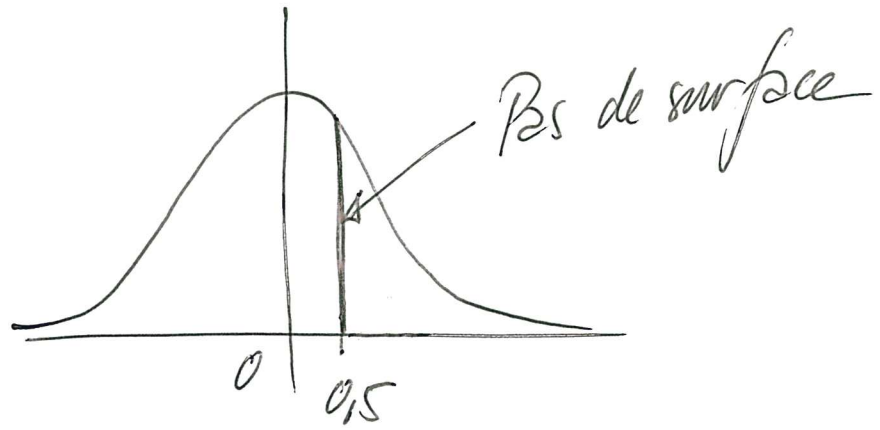


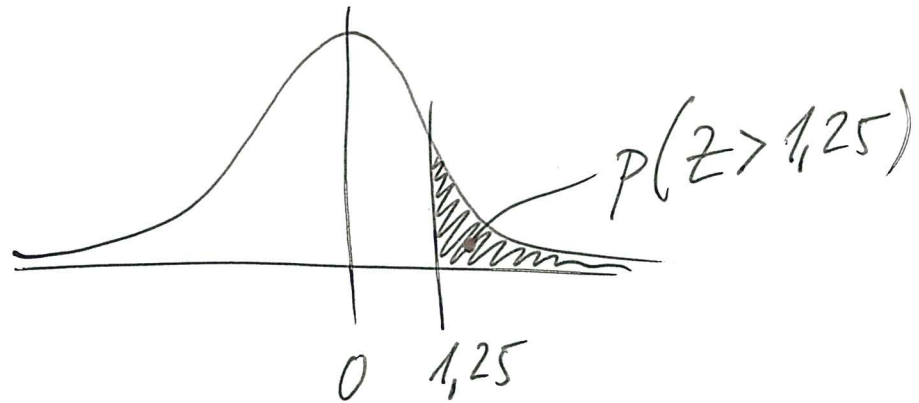
5.4

a)



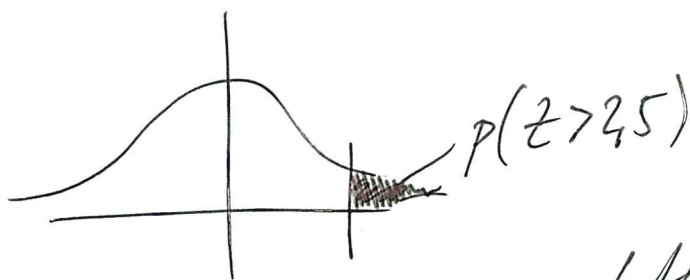
$$P(z = 0,5) = 0$$

b)



$$\begin{aligned} p(z > 1,25) &= 1 - p(z < 1,25) \\ &= 1 - 0,8944 = 0,1056 \end{aligned}$$

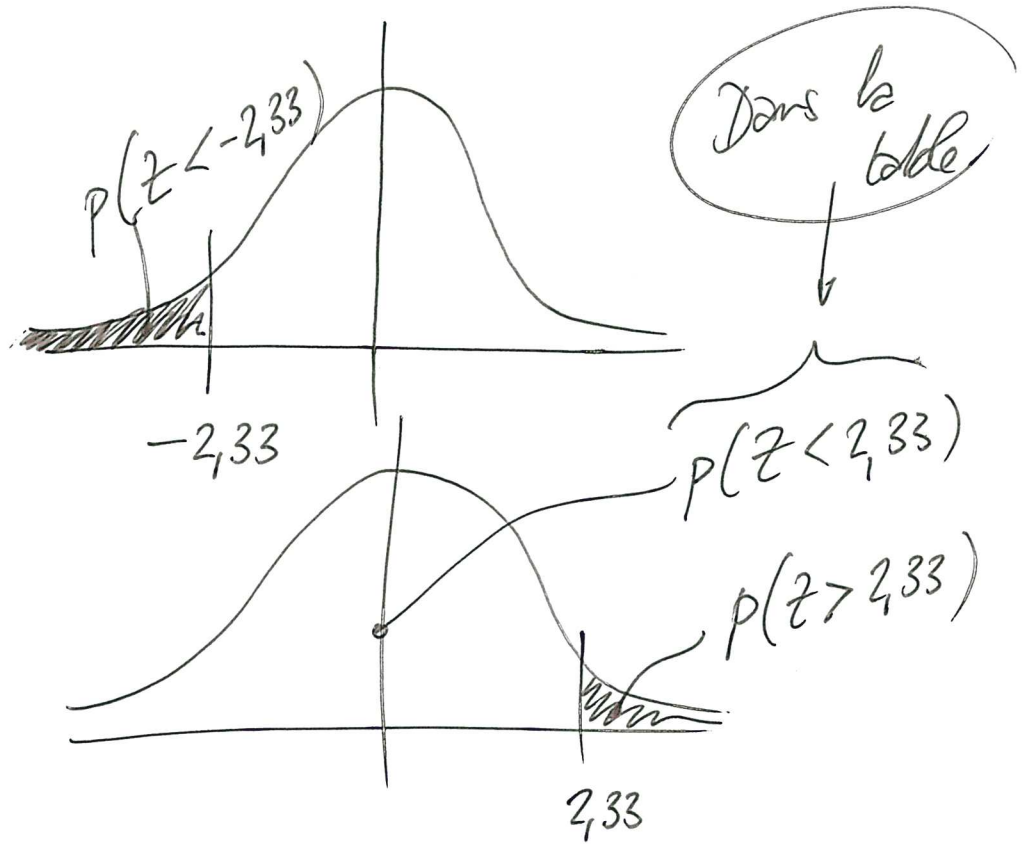
$$\begin{aligned} c) \quad p(z > 2,5) &= 1 - p(z < 2,5) = 1 - \underbrace{0,9938} \\ &= 0,0062 \end{aligned}$$



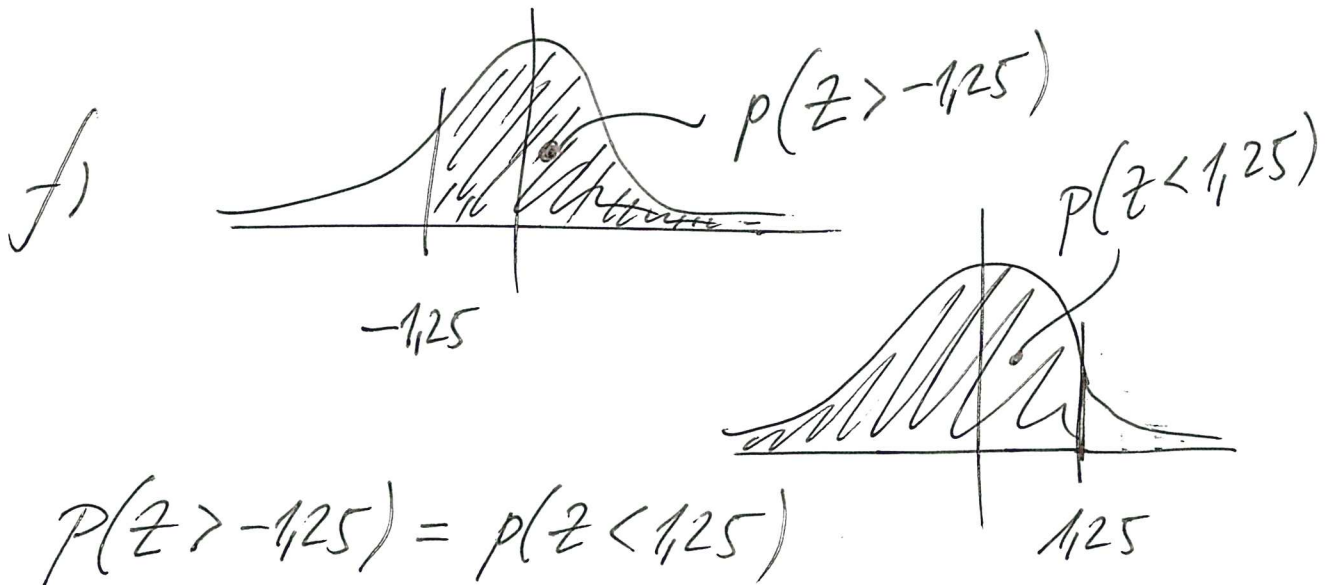
$$d) \quad p(z < 2,5) = \overset{\text{table}}{=} 0,9938$$

5.4

e)



$$\begin{aligned} P(Z < -2.33) &= P(Z > 2.33) \\ &= 1 - P(Z < 2.33) = 1 - 0.9901 \\ &= 0.0099 \end{aligned}$$



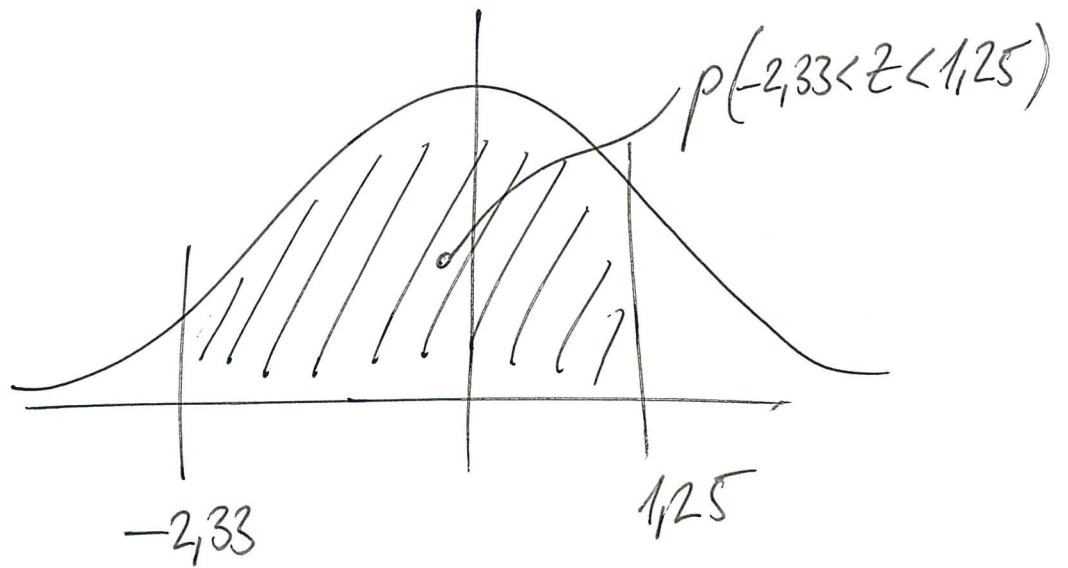
$$P(Z > -1.25) = P(Z < 1.25)$$

$$= 0.8944$$

table

5.4<sub>3</sub>

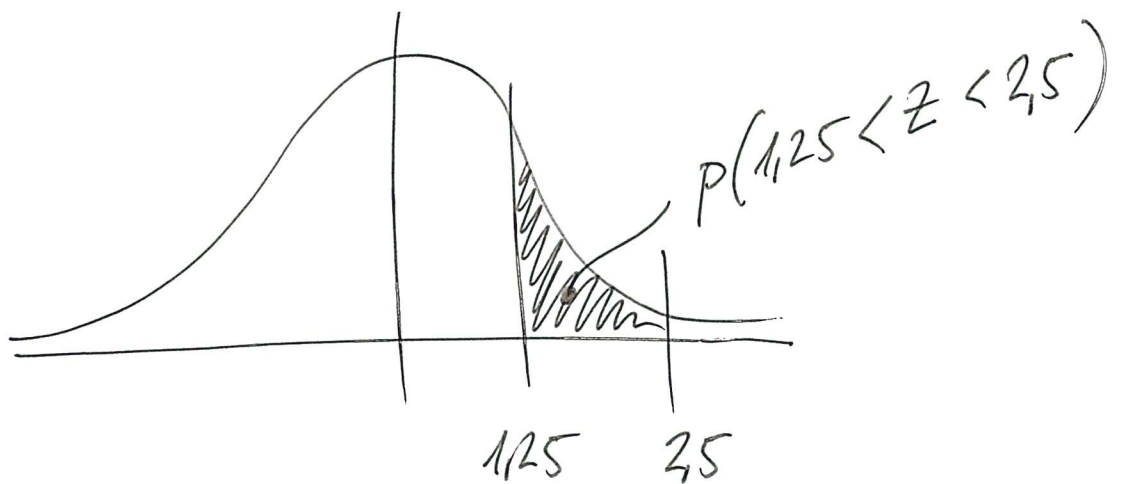
g)



$$P(-2.33 < z < 1.25) = \underbrace{P(z < 1.25)}_{\text{table}} - \underbrace{P(z < -2.33)}_{\text{question e)}}$$

$$= 0.8944 - 0.0099 = 0.8845$$

h)



$$P(1.25 < z < 2.5) = \underbrace{P(1.25 < z)}_{\text{question b)}} - P(z > 2.5)$$

$$\text{Or } P(z > 2.5) = 1 - \underbrace{P(z < 2.5)}_{\text{question d)}}$$

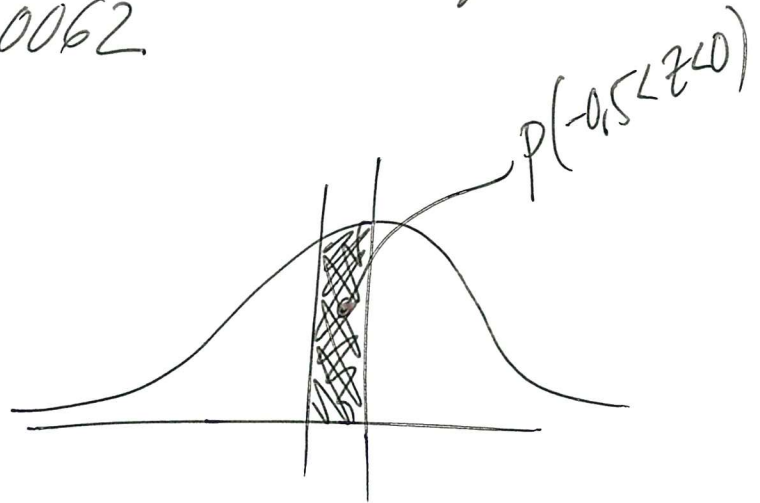
5.4<sub>4</sub>

$$\Rightarrow P(1,25 < Z < 2,5) = 0,1056 - \underbrace{(1 - 0,9938)}_{\text{question c)}}$$

$$= 0,1056 - 0,0062$$

$$= 0,0994$$

i)



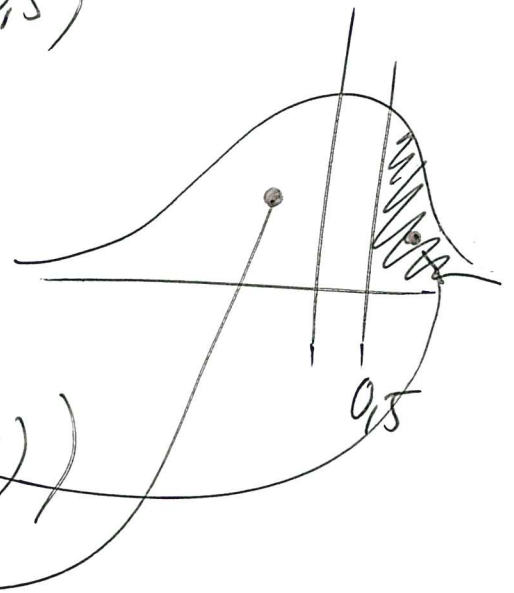
$$P(-0,5 < Z < 0) = 0,5 - P(Z < -0,5)$$

$$= 0,5 - P(Z > 0,5)$$

↑  
symétrie

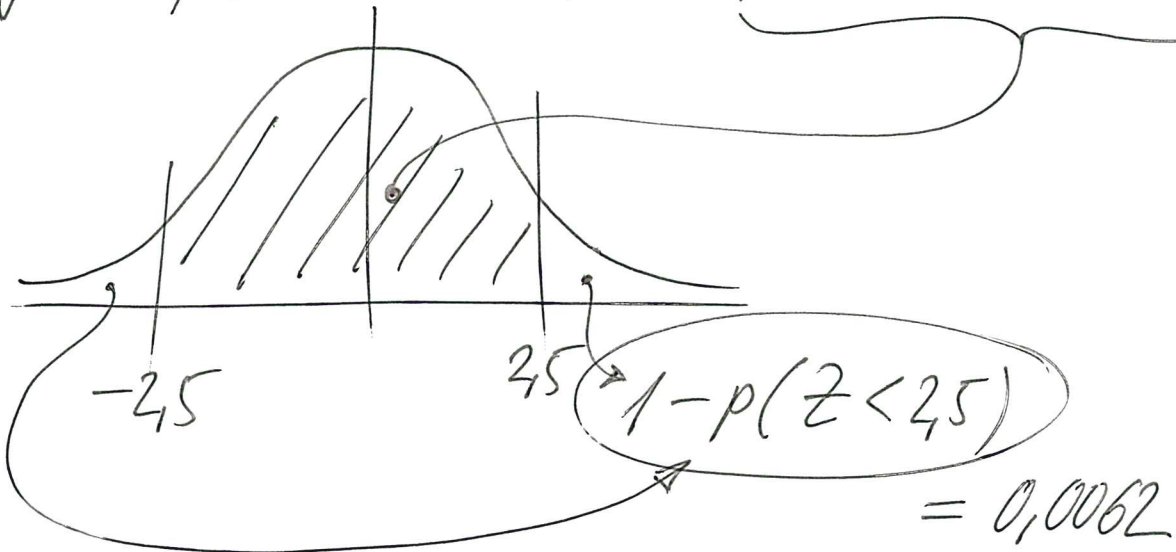
$$= 0,5 - (1 - P(Z < 0,5))$$

$$= 0,5 - (1 - 0,6915) = 0,1915$$



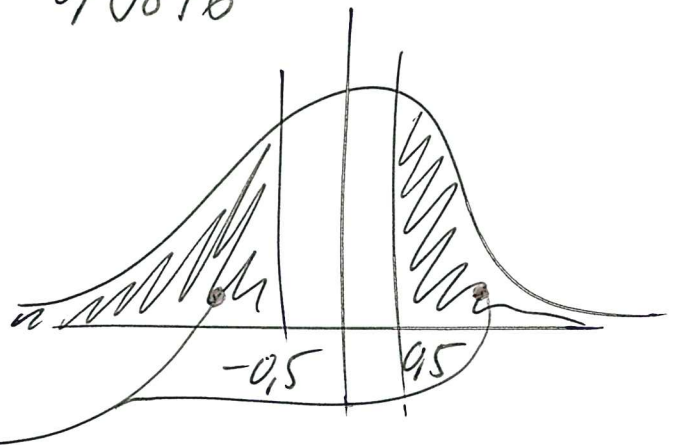
5.4

$$j) p(|z| < 2.5) = p(-2.5 < z < 2.5)$$

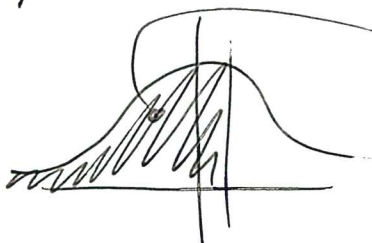


$$\Rightarrow p(|z| < 2.5) = 1 - 2 \cdot 0,0062$$
$$= 0,9876$$

$$k) p(|z| > 0.5)$$



$$p(z < -0.5 \text{ or } z > 0.5) = 2 \cdot (1 - p(z < 0.5))$$



$$= 2(1 - 0,6915)$$

$$= 0,617$$

5.4  
6

$$c) P(Z \in ]-\infty; 0] \cup ]0,5; +\infty[) =$$



$$\rightarrow = 0,5 + 1 - P(Z < 0,5)$$

$$= 0,5 + 1 - 0,6915$$

$$= 0,8085$$

5.6

$N(\mu, \sigma^2)$  

$$a) z = \frac{60 - 50}{4} = 2,5 \quad (\sigma^2 = 16 / \sigma = 4)$$

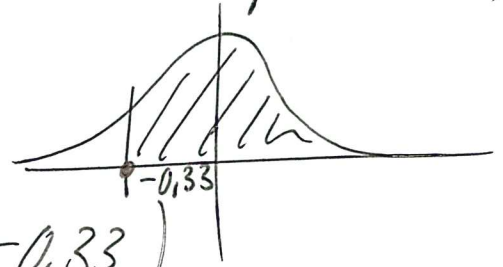
$$\Rightarrow P(X > 60) = P(Z > 2,5)$$

$$= 1 - P(Z < 2,5)$$

$$= 1 - 0,9938 = 0,0062$$

$$b) z = \frac{3,9 - 4}{0,3} \quad (\sigma^2 = 0,09 / \sigma = 0,3)$$

$$\approx -0,33$$



$$P(X \geq 3,9) = P(Z \geq -0,33)$$

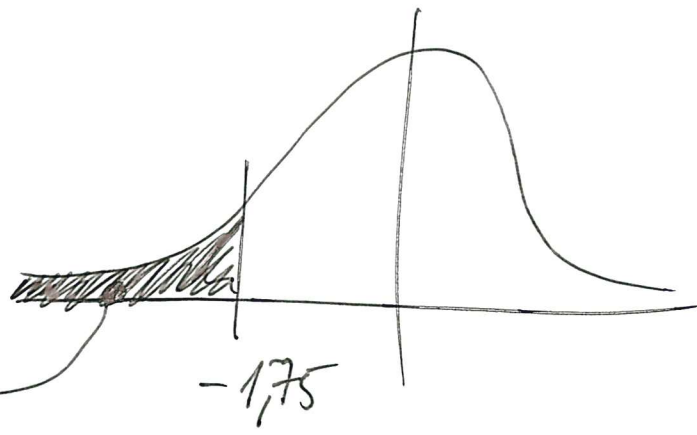
$$= P(Z \leq 0,33)$$

$$= 0,6293$$

$$c) z = \frac{325 - 500}{100} = -1,75 \quad (\sigma^2 = 10000 / \sigma = 100)$$

$$P(X < 325) = P(Z < -1,75)$$

5.6



$$P(Z < -1.75)$$

-1.75

$$\Rightarrow P(X < 325) = 1 - P(Z < 1.75)$$

$$= 1 - 0.9599$$

$$= 0.0401$$

$$d) P(-1 < X < 2)$$

$$\sigma = \sqrt{4} = 2$$

$$\frac{-1 - 1.5}{2} = -1.25$$

$$\frac{2 - 1.5}{2} = 0.25$$

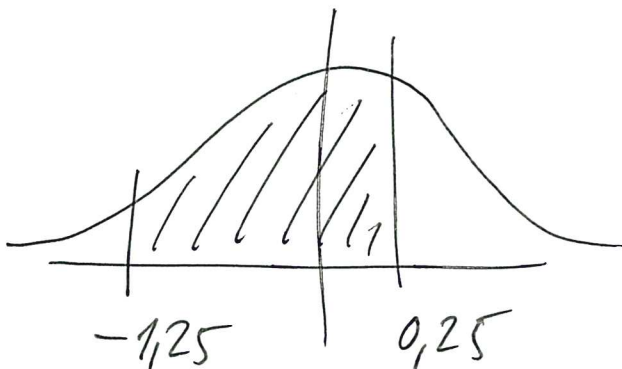
$$P(-1.25 < Z < 0.25) = P(Z < 0.25)$$

$$- (1 - P(Z < 1.25))$$

$$= 0.5987 - (1 - 0.8944)$$

$$= 0.5987 - 0.1056$$

$$= 0.4931$$





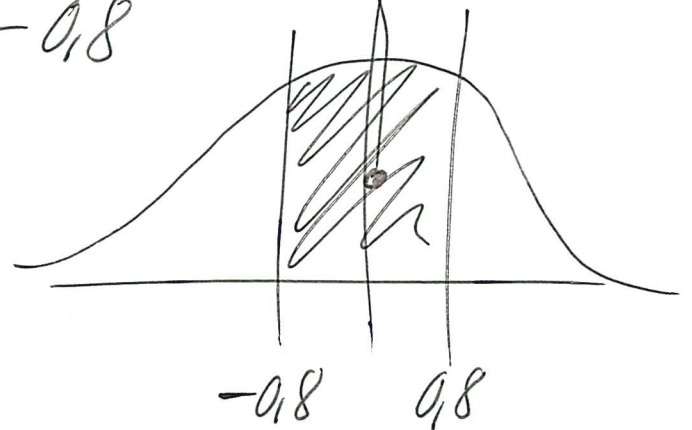
5.6

e)  $p(20 < X < 28)$

$$\sigma = \sqrt{25} = 5$$

$$\frac{20 - 24}{5} = -\frac{4}{5} = -0,8$$

$$\frac{28 - 24}{5} = 0,8$$



$$p(-0,8 < z < 0,8) = 2 \cdot (p(z < 0,8) - 0,5)$$

$$= 2(0,7881 - 0,5) = 2 \cdot 0,2881$$

$$= 0,5762$$

f)  $p(X < -1 \text{ or } X > 1)$

$$\sigma = \sqrt{10} \approx 3,162$$

$$\frac{-1 - 0}{\sqrt{10}} \approx -0,32$$

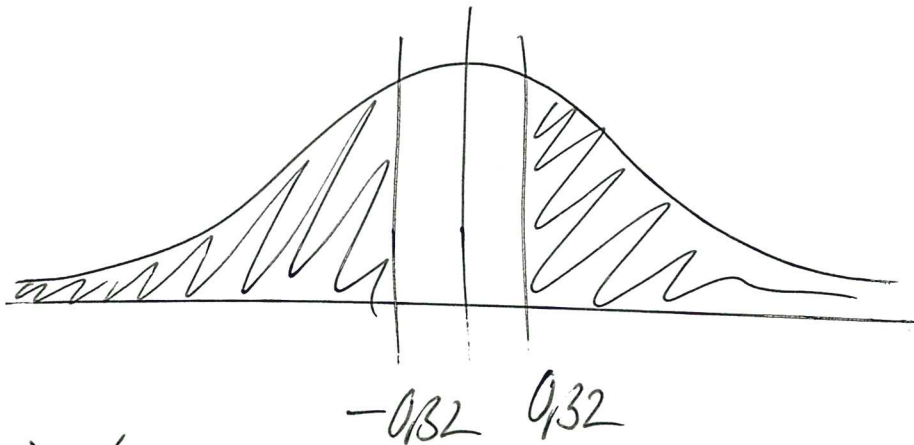
$$\frac{1 - 0}{\sqrt{10}} \approx 0,32$$

5.6

4

On doit donc calculer

$$P(Z < -0,32 \text{ ou } Z > 0,32)$$



ce qui donne :

$$\begin{aligned} & 2 \cdot (1 - P(Z < 0,32)) \\ & = 2 (1 - 0,6255) = 0,749 \end{aligned}$$