Ex 8

1a) 0,9332

1b) 0,0808

1c) 0,8524

2) $P(X \leq 10+a) = 0,8 + \frac{1-0,8}{2} = 0,9$

$a = 0,0256$

Ex 9

1. 0,16 2. 0,95 3. 12,88

Ex 10

0,97

Ex 11

1. $P(X > 40) = 0,69$

2. $P(X \leq 50+a) = 0,9 + \frac{1-0,9}{2} = 0,95$

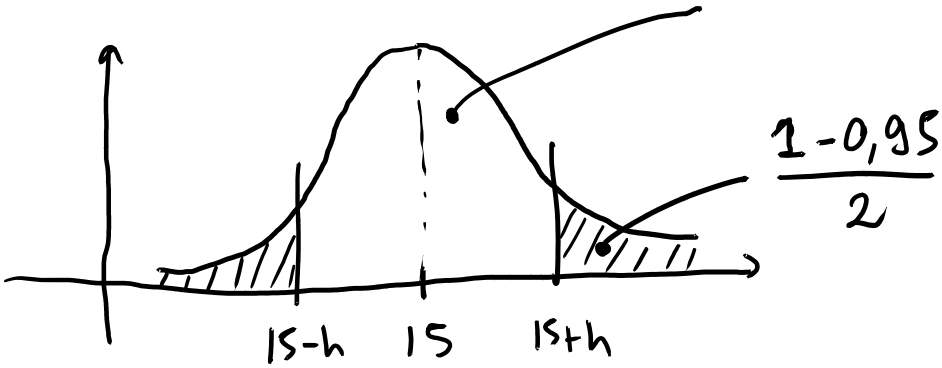
$\hookrightarrow 50+a = 82,90 \Rightarrow a = 32,90$

Ex 12

1. $P(14,3 \leq X \leq 15,5) = 0,9007$

Le pourcentage de pièces valables est 90,07%

2. $P(15-h \leq D \leq 15+h) = 0,95$



$$P(D \leq 15+h) = 0,95 + \frac{1-0,95}{2} = 0,975$$

$$15+h = 15,686 \Rightarrow h = 0,686.$$

3. $m = 14,9$ mm $\quad \sigma = ?$

$$P(14,3 \leq D \leq 15,5) = 0,9$$

Changement de variable $T = \frac{D-m}{\sigma}$

Alors T suit la loi normale $N(0;1)$

$$P\left(\frac{14,3-14,9}{\sigma} \leq T \leq \frac{15,5-14,9}{\sigma}\right) = 0,9$$

$$P\left(-\frac{0,6}{\sigma} \leq T \leq \frac{0,6}{\sigma}\right) = 0,9$$

$$P\left(T \leq \frac{0,6}{\sigma}\right) = 0,9 + \frac{1-0,9}{2} = 0,95$$

Donc $\frac{0,6}{\sigma} = 1,645 \Rightarrow \sigma = 0,365$

Ex 13

1. $P(X \geq 55) = 0,1056$

   $P(48 \leq X \leq 52) = 0,3829$

2. $P(X < r) = 0,025 \Rightarrow r = 42$

Ex 14

1. $P(4,54 \leq X \leq 5,46) = 0,9342$

2. X suit $\mathcal{N}(5; \sigma)$

   Alors $T = \frac{X-5}{\sigma}$ suit $\mathcal{N}(0; 1)$

   $P(4,54 \leq X \leq 5,46) = 0,97$

   $P\left(\frac{4,54-5}{\sigma} \leq T \leq \frac{5,46-5}{\sigma}\right) = 0,97$

   $P\left(-\frac{0,46}{\sigma} \leq T \leq \frac{0,46}{\sigma}\right) = 0,97$

$P\left(T \leq \frac{0,46}{\sigma}\right) = 0,97 + \frac{1-0,97}{2} = 0,985$

$\Rightarrow \frac{0,46}{\sigma} = 2,1701 \Rightarrow \sigma = \frac{0,46}{2,1701} = 0,212$