

29. De una muestra de 75 pilas eléctricas, se dan estos datos sobre su duración:

| TIEMPO (en horas) | N.º DE PILAS |
|-------------------|--------------|
| 25-30             | 3            |
| 30-35             | 5            |
| 35-40             | 21           |
| 40-45             | 28           |
| 45-55             | 12           |
| 55-70             | 6            |

a) Halla  $\bar{x}$  y  $\sigma$  y calcula el porcentaje de pilas que hay en el intervalo  $(\bar{x} - \sigma, \bar{x} + \sigma)$ .

b) Calcula  $Q_1$ ,  $Me$ ,  $Q_3$ ,  $P_{30}$ ,  $P_{60}$  y  $P_{95}$ .

a)

| $x_i$ | $f_i$ | $f_i x_i$ | $f_i x_i^2$ |
|-------|-------|-----------|-------------|
| 27,5  | 3     | 82,5      | 2 268,75    |
| 32,5  | 5     | 162,5     | 5 281,25    |
| 37,5  | 21    | 787,5     | 29 531,25   |
| 42,5  | 28    | 1 190     | 50 575      |
| 50    | 12    | 600       | 30 000      |
| 62,5  | 6     | 375       | 23 437,5    |
|       | 75    | 3 197,5   | 141 093,75  |

$$\bar{x} = \frac{3197,5}{75} = 42,63$$

$$\sigma = \sqrt{\frac{141093,75}{75} - 42,63^2} = \sqrt{63,9331} \approx 8$$

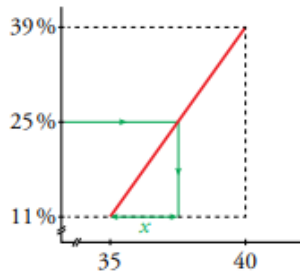
$$\bar{x} - \sigma = 34,63$$

$$\bar{x} + \sigma = 50,63$$

En el intervalo (34,63; 50,63) hay, aproximadamente, 61 pilas, lo que supone un 81,33%.

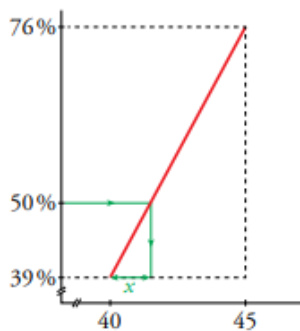
b)

| EXTREMOS | $F_i$ | % ACUM.           |
|----------|-------|-------------------|
| 25       | 0     | 0                 |
| 30       | 3     | 4                 |
| 35       | 8     | 10,7 $\approx$ 11 |
| 40       | 29    | 38,7 $\approx$ 39 |
| 45       | 57    | 76                |
| 55       | 69    | 92                |
| 70       | 75    | 100               |



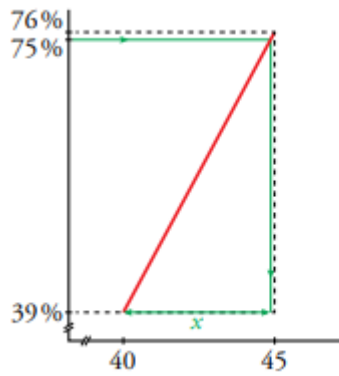
$$\frac{39 - 11}{25 - 11} = \frac{40 - 35}{x}$$

$$x = 2,5 \rightarrow Q_1 = 35 + 2,5 = 37,5$$



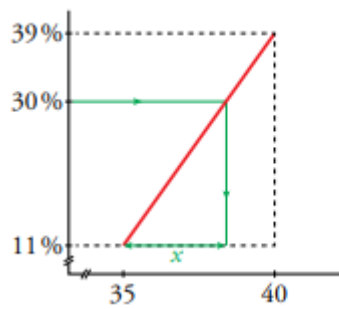
$$\frac{76 - 39}{50 - 39} = \frac{45 - 40}{x}$$

$$x = 1,86 \rightarrow Me = 40 + 1,86 = 41,86$$



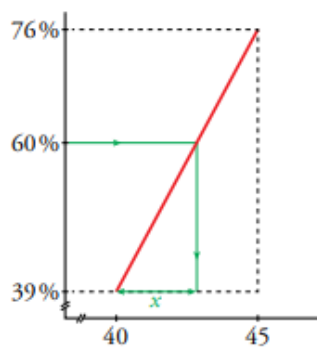
$$\frac{76 - 39}{75 - 39} = \frac{45 - 40}{x}$$

$$x = 4,86 \rightarrow Q_3 = 40 + 4,86 = 44,86$$



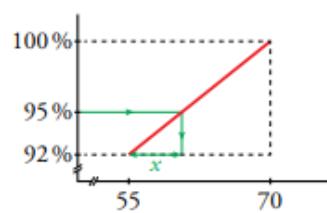
$$\frac{39 - 11}{30 - 11} = \frac{40 - 35}{x}$$

$$x = 3,39 \rightarrow p_{30} = 35 + 3,39 = 38,39$$



$$\frac{76 - 39}{60 - 39} = \frac{45 - 40}{x}$$

$$x = 2,84 \rightarrow p_{60} = 40 + 2,84 = 42,84$$



$$\frac{100 - 92}{95 - 92} = \frac{70 - 55}{x}$$

$$x = 5,63 \rightarrow p_{95} = 55 + 5,63 = 60,63$$