

Q2

amount withdrawn
x

No of withdrawals
f

fx

fx²

£10

12

120

1,200

£20

82

1,640

32,800

£30

125

3,750

112,500

£40

74

2,960

118,400

£50

7

350

17,500

300

8,820

282,400

(i) mean

$$\bar{x} = \frac{\sum fx}{\sum f} = \frac{8820}{300} = £29.4$$

(ii) mode = £30

(iii) variance = $\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f} \right)^2$

$$= \frac{282400}{300} - \left(\frac{8820}{300} \right)^2$$

$$= 941.33 - 864.36 = 76.97 £^2$$

(iv) standard deviation = $\sqrt{\text{variance}}$

$$= \sqrt{76.97}$$

$$= £8.77$$

Q3

weekly wage

x

f (No. of workers)

fx

fx²

140 — 160

150

7

1,050

157,500

160 — 180

170

20

3,400

578,000

180 — 200

190

33

6,240

1,191,300

200 — 220

210

25

5,250

1,102,500

220 — 240

230

11

2,530

581,900

240 — 260

250

4

1,000

250,000

1,200

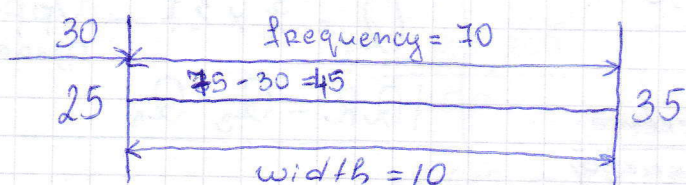
100

19,500

3,861,200

$$(b) \text{ Median} = \frac{1}{2} \times \sum f$$

$$= \frac{1}{2} \times 450 = 45^{\text{th}} \text{ position}$$

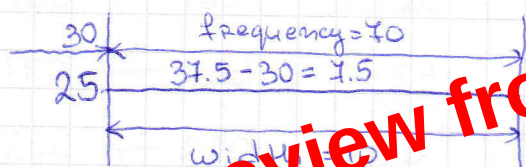


$$\text{Median} = \text{Lower Limit} + \text{width} \times \frac{\text{Difference}}{\text{Frequency}}$$

$$= 25 + \left(10 \times \frac{15}{70} \right)$$

$$= 31.4 \text{ years}$$

$$(c) Q_1 = \frac{1}{4} \times \sum f = \frac{1}{4} \times 150 = 37.5^{\text{th}} \text{ position}$$

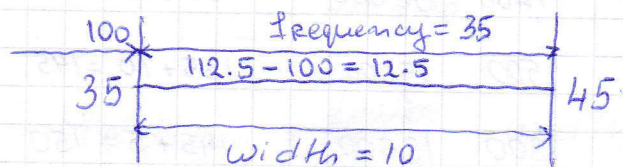


$$Q_1 = \text{Lower Limit} + \text{width} \times \frac{\text{Difference}}{\text{Frequency}}$$

$$= 25 + \left(10 \times \frac{7.5}{70} \right)$$

$$= 26.1 \text{ years} - \text{Lower quartile}$$

$$Q_3 = \frac{3}{4} \times \sum f = \frac{3}{4} \times 150 = 112.5^{\text{th}} \text{ position}$$



$$Q_3 = \text{Lower Limit} + \text{width} \times \frac{\text{Difference}}{\text{Frequency}}$$

$$= 35 + \left(10 \times \frac{12.5}{35} \right)$$

$$= 38.6 \text{ years} - \text{Upper quartile}$$

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