

HW Part 2] Hand-Drawn Graphs

Create graphs by hand using the provided datasets.

- 2) Given the numbers: -5, -2, 0, 3, 4, 5, 5, 6, 7, 8, 9, 9, 10, 12, 15 draw an ECDF plot

-5	-2	0	3	4	5	5	6	7	7	8	9	9	10	12	15
$\frac{1}{16}$	$\frac{2}{16}$	$\frac{3}{16}$	$\frac{4}{16}$	$\frac{5}{16}$	$\frac{6}{16}$	$\frac{7}{16}$	$\frac{8}{16}$	$\frac{9}{16}$	$\frac{10}{16}$	$\frac{11}{16}$	$\frac{12}{16}$	$\frac{13}{16}$	$\frac{14}{16}$	$\frac{15}{16}$	

$$F_n(t) = \frac{\text{number of elements in the sample} \leq t}{n} = \frac{1}{16} \sum_{x_i < t} 1$$

$$\text{ECDF } X = -5 \quad F(-5) = \frac{1}{16} = 0,0625$$

$$X = -2 \quad F(-2) = \frac{2}{16} = \frac{1}{8} = 0,125$$

$$\textcircled{1} \quad X = 0 \quad F(0) = \frac{3}{16} = 0,1875$$

$$X = 3 = \frac{4}{16} = 0,25$$

$$X = 6 = \frac{8}{16} = 0,5$$

$$X = 4 = \frac{5}{16} = 0,3125$$

$$X = 7 = \frac{10}{16} = 0,625$$

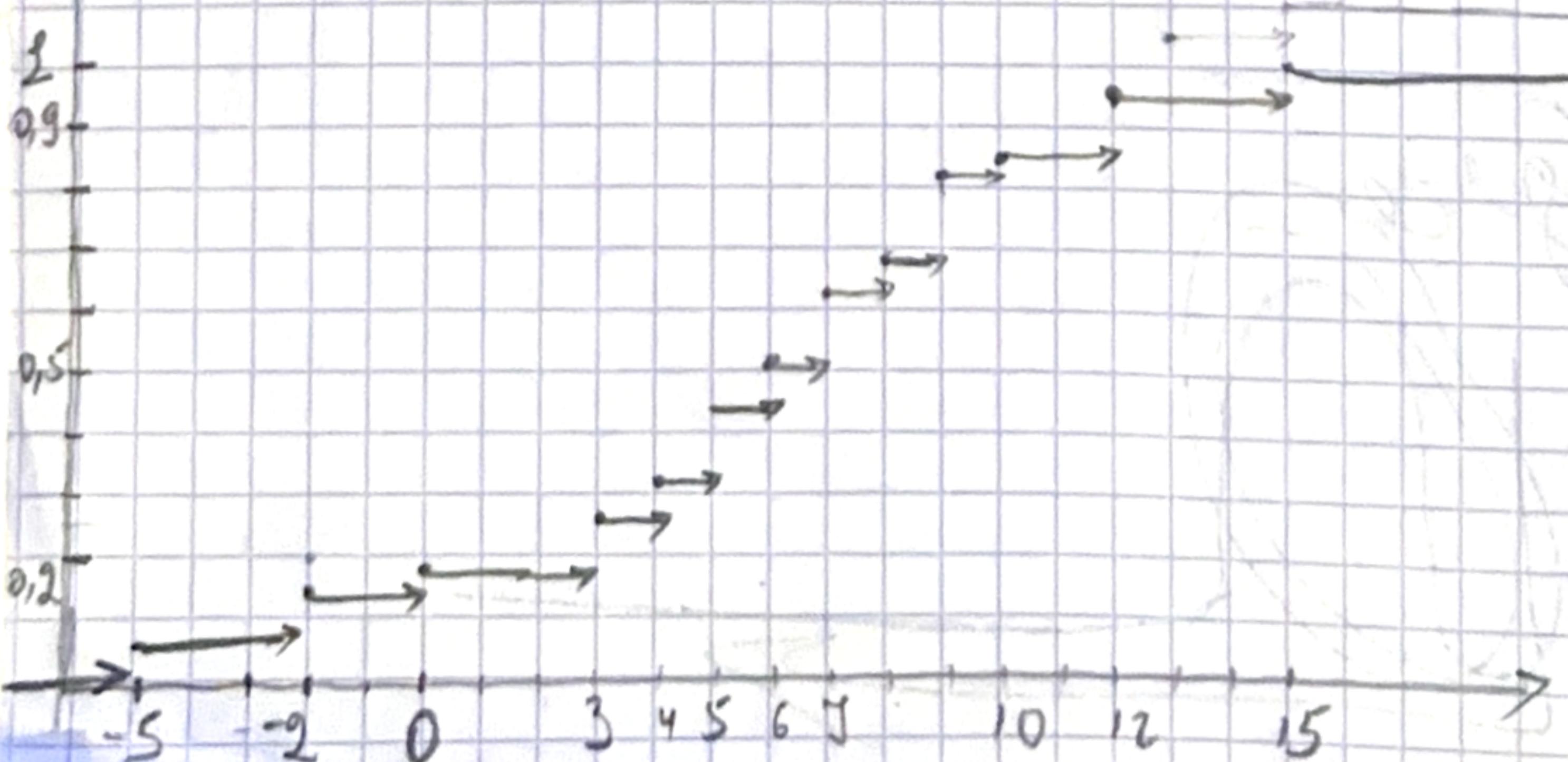
$$X = 5 = \frac{7}{16} = 0,4375$$

$$X = 8 = \frac{11}{16} = 0,6875$$

$$X = 9 = \frac{13}{16} = 0,8125$$

$$X = 10 = \frac{14}{16} = 0,875$$

$$X = 12 \cdot \frac{15}{16} = 0,9375 \quad X = 15 \cdot \frac{16}{16} = 1$$



2) Given the dataset: -5, 12, 14, 14, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 24, 25, 25, 29, 30, 35, create a boxplot. indicate the median, quartiles and any potential outliers.

-5, 12, 14, 14, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 24, 25, 25, 29, 30, 35

$$n = 19$$

Q₁ - lower half

-5, 12, 14, 14, 15, 16, 17, 18, 19, 20, median = 20

$$Q_1 = 15$$

Q₃ third quartile upper half

21, 22, 23, 24, 24, 25, 29, 30, 35

$$Q_3 = 29$$

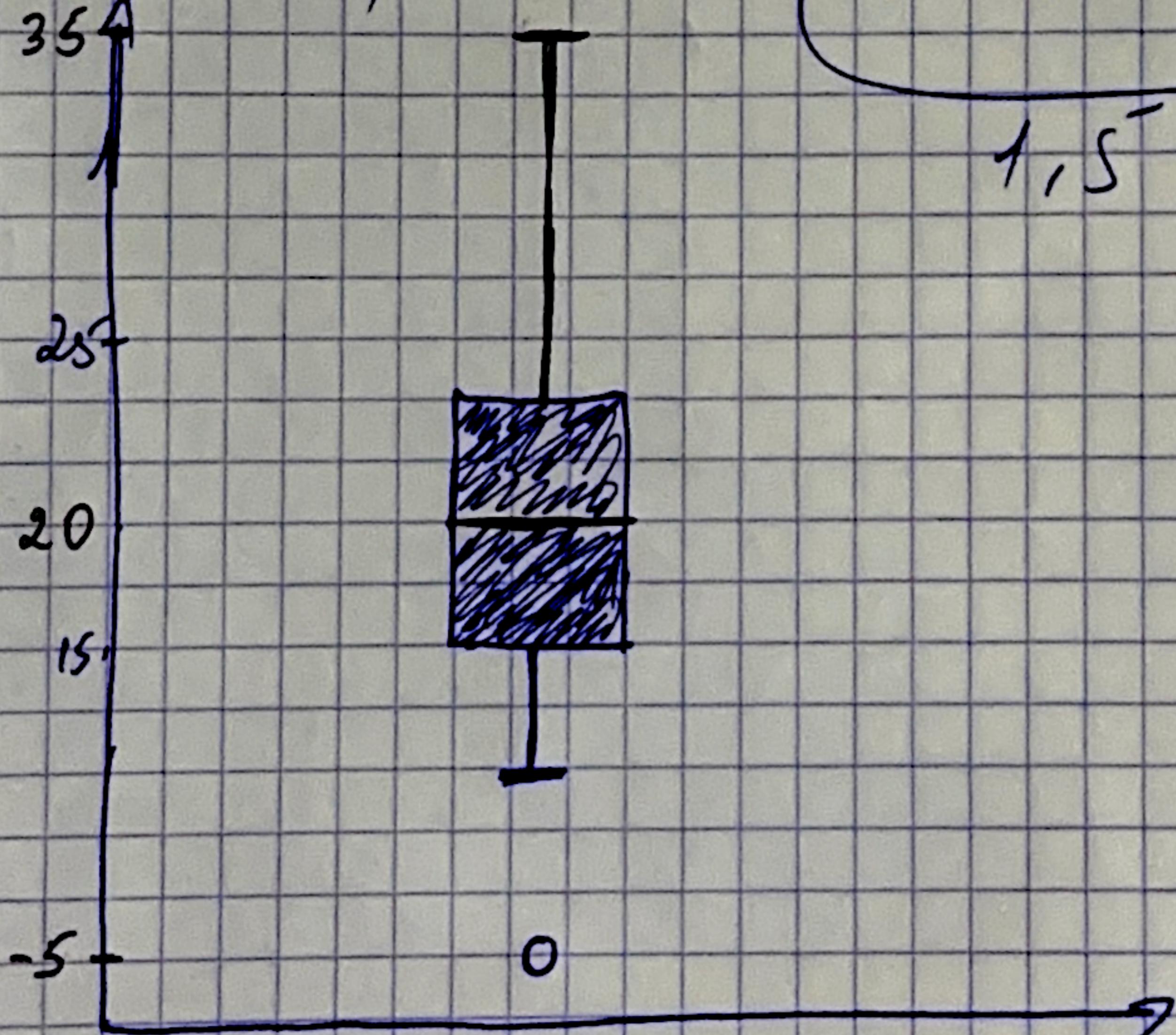
$$IQR = Q_3 - Q_1 = 9$$

lower bound upper bound

$$Q_1 - 1.5 \cdot IQR, Q_3 + 1.5 \cdot IQR$$

$$1, 5$$

$$34, 5$$



3) Given the test scores: -10, 45, 50, 55, 55, 60, 62, 68, 68, 70, 83, 84, 80, 80, 82, 85, 88, 90, 91, 92, 94, 97, 100, 105, create histogram using 5 bins and label the axis

Lowest -10

Hg. 105

Range - 115

Bin width = range / no. of bins

$$\frac{115}{5} = 23$$

$$-10 - 13$$

$$13 - 36$$

$$36 - 59$$

$$59 - 82$$

$$82 - 105$$

