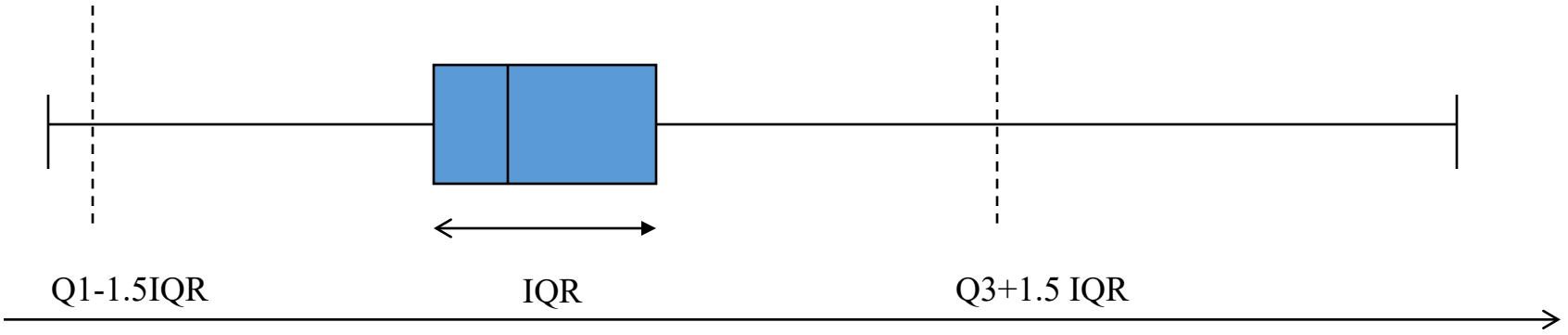
Boxplots - Testing for Outliers

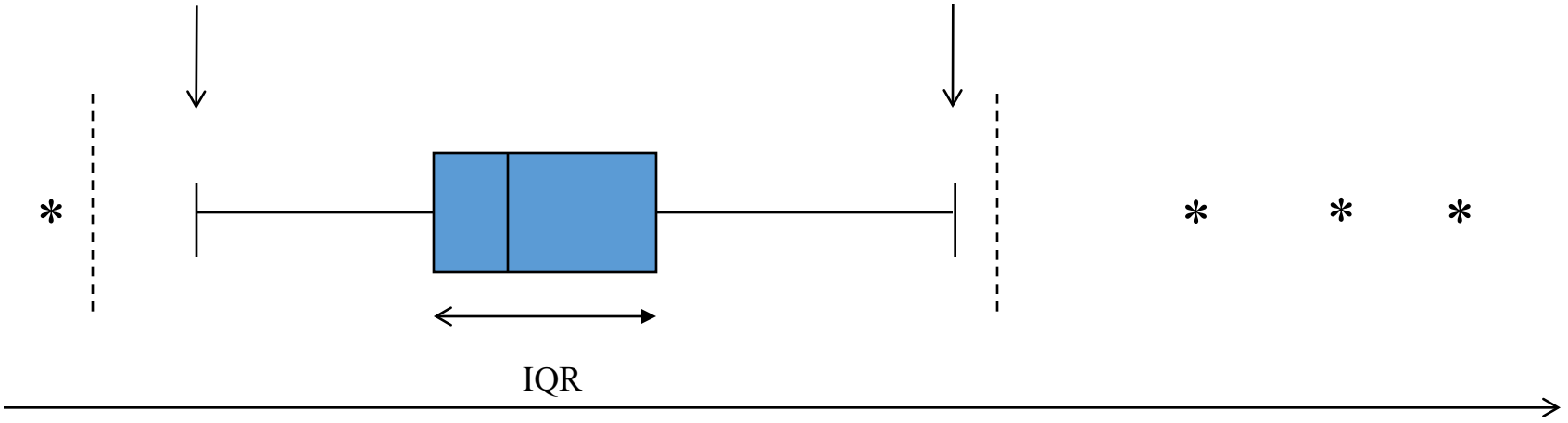
1.5 IQR Criterion

1. Compute the 5-number summary.
2. Compute the IQR= Q_3 - Q_1.
3. Observations outside of range [Q_1 – 1.5IQR, Q_3 + 1.5 IQR] are considered outliers.



Modified Boxplot

* = outlier



CASE : Statistics Test Scores

- A sample of students obtained the following scores on a statistics tests.

65	13	75	89	92	73	82	85
92	87	95	62	79	82	91	87
65	81	92	86	31	63	74	85

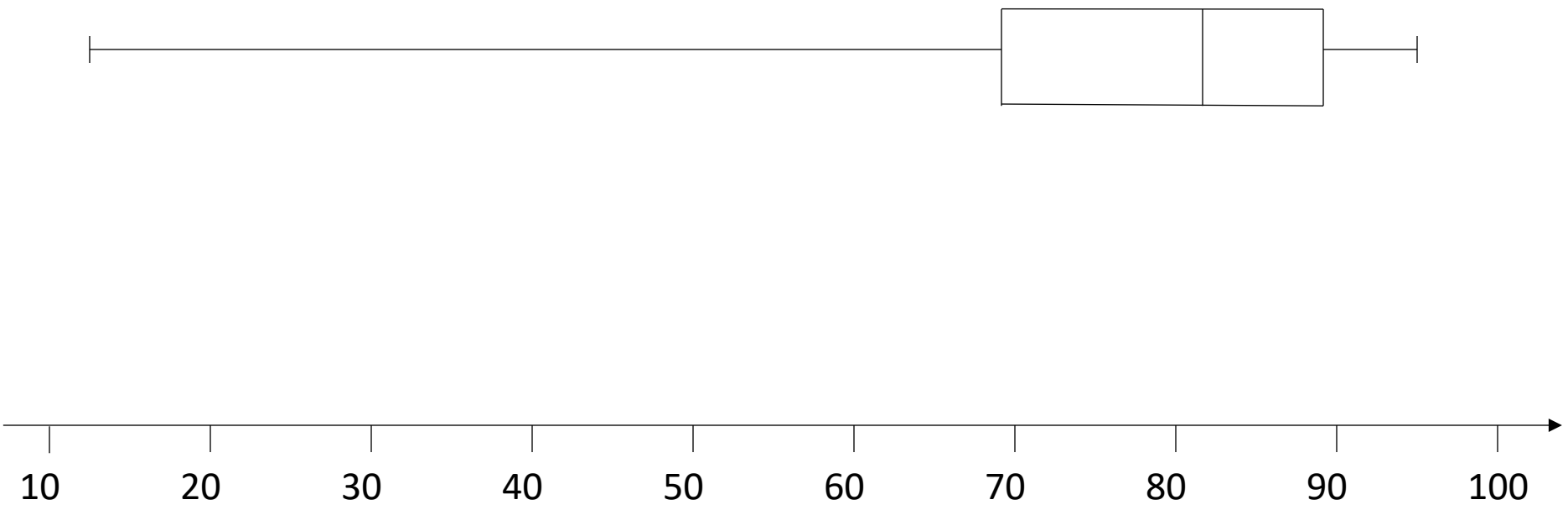
In order:

13	31	62	63	65	65	73	74
75	79	81	82	82	85	85	86
87	87	89	91	92	92	92	95

Q_1=69 M=82 Q_3=88

Five Number Summary and Boxplot

$MIN=13$ $Q_1=69$ $M=82$ $Q_3=88$ $MAX=95$



Modified Boxplot

MIN=13 Q_1=69 M=82 Q_3=88 MAX=95

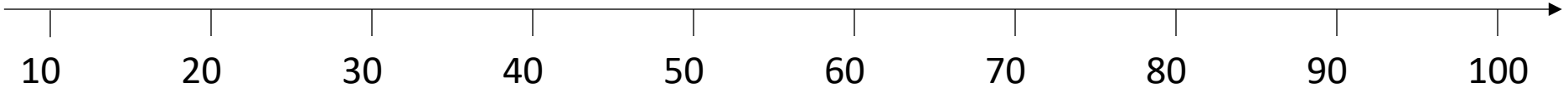
65	13	75	89	92	73	82	85
92	87	95	62	79	82	91	87
65	81	92	86	31	63	74	85

IQR = 88-69 = 19

1.5 IQR = 19 x 1.5 = 28.5

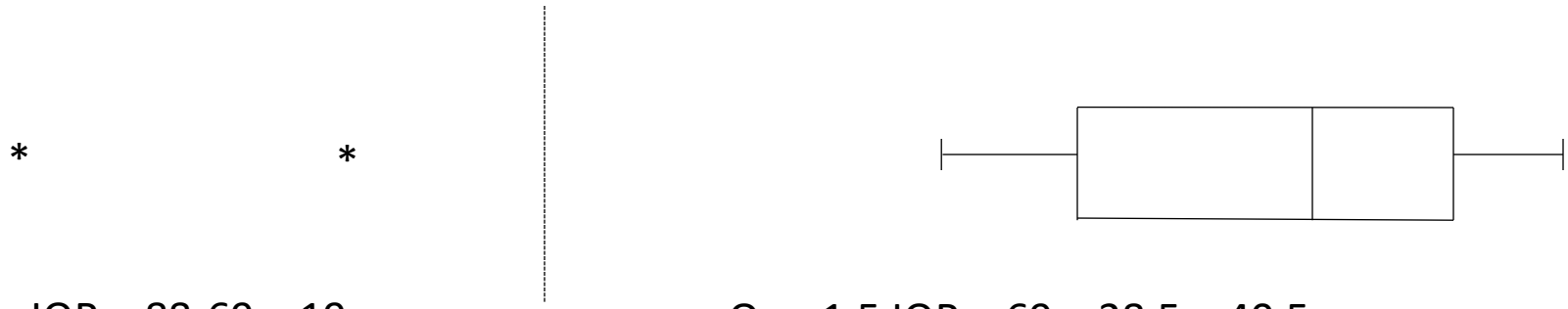
Q_1 – 1.5 IQR = 69 – 28.5 = 40.5

Q_3 + 1.5 IQR = 88 + 28.5 = 116.5



Modified Boxplot

$MIN=13$ $Q_1=69$ $M=82$ $Q_3=88$ $MAX=95$



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