Q1.

Write the data in order (ascending)

27, 28, 29, 31, 32,
33, 34, 35, 36, 37,
38, 39, 40, 41, 42,
44, 45, 46, 47, 48,
49, 52, 53, 55, 56

Key: 2 | 7 = 27 cm

2	7	8	9						
3	1	2	3	4	5	6	7	8	
4	0	1	2	4	5	6	7	8	9
5	2	3	5	6					

Q2.

Arrange the times in order

49, 53, 54, 56, 60, 62, 65, 68, 70, 72

Key: 4 | 9 = 49 seconds

4	9			
5	3	4	6	
6	0	2	5	8
7	0	2		

Q3.

Arrange the times in order

125, 127, 128, 129, 131, 133, 134, 135, 136, 140, 141, 141, 142, 143, 150, 154, 156

Median is the $(\frac{17+1}{2})^{th}$ value = 9^{th} value = 136

Q4.

Key: 15 | 3 = 153 cm

15	3 4 8 9
16	0 2 5 6 7 8
17	0 2 4 7 9
18	0 1 3 4 5 6 7 9
19	0 0

Q5.

Arrange the scores in order

61, 65, 66, 68, 69, 71, 72, 73, 74, 76, 77, 79, 81, 82, 84, 89, 92, 95

Key: 6 | 1 = 61

6	1 5 6 8 9
7	1 2 3 4 6 7 9
8	1 2 4 9
9	2 5

(b)

There are 18 students.

Find those with scores > 85
These are: 89, 92, 95 → 3 students.

Step 3: Probability

P (score > 85) = $\frac{3}{18}$ or $\frac{1}{6}$

Q6.

Key: 3 | 8 = 38 years

3	8	9	5		
7	1	3	4	5	6
6	2	1	0	2	3

So, the data is:
35, 38, 39, 60, 61, 62, 62, 63, 71, 73, 74, 75, 76

a)

$$\text{Range} = \text{Highest} - \text{Lowest} = 76 - 35 = 41$$

(b)

Median is the $(\frac{13+1}{2})^{th}$ value = 7^{th} value = 62 years

Q7.

Arrange the masses in ascending order

1.3, 1.5, 1.7, 1.8,
2.1, 2.2, 2.4, 2.5, 2.6, 2.7, 2.8,
3.0, 3.1, 3.3, 3.5, 3.6, 3.7, 3.9,
4.0, 4.2

(a)

Stems = whole number part, Leaves = decimal part ×10

Key: 1 | 3 = 1.3 kg

1	3 5 7 8
2	1 2 4 5 6 7 8
3	0 1 3 5 6 7 9
4	0 2

(b)

There are 20 values (even number).

Median is between the 10th and 11th values.

So, 10th = 2.7, 11th = 2.8

$$\text{Median} = \frac{2.7+2.8}{2} = \frac{5.5}{2} = 2.75$$

Q8.

Arrange speeds in ascending order

46, 47, 48, 49, 50,
52, 53, 54, 55, 55,
56, 57, 58, 59, 60,
61, 62, 63, 64, 65,
66, 67, 68, 69, 70,
71, 72, 73, 74, 75

(a)

Key: 4 | 6 = 46 mph

4	6	7	8	9						
5	0	2	3	4	5	5	6	7	8	9
6	0	1	2	3	4	5	6	7	8	9
7	0	1	2	3	4	5				

(b)

Total = 30 values (even number).

Median = average of 15th and 16th values.

$$\text{Median} = \left(\frac{15+16}{2}\right)^{\text{th}} \text{ value} = 60.5 \text{ mph}$$

Q9.

Arrange data in ascending order

21, 22, 25, 26, 27, 28, 29, 31, 32, 34, 36, 38, 39, 41, 42, 44, 47, 50, 53, 55, 58

(a)

Key: 2 | 1 = 21 years

2	1 2 5 6 7 8 9
3	1 2 4 6 8 9
4	1 2 4 7
5	0 3 5 8

(b)

There are 21 employees.

Count those > 40

41, 42, 44, 47, 50, 53, 55, 58 → 8 employees

$$P(\text{age} > 40) = \frac{8}{21}$$

Q10.

(Stem = tens, Leaf = units)
Key: 4 | 6 = 46

4	6 7 8 9
5	3 4 6 7 8
6	1 3 4 7 9
7	1 2 8
8	1 5
9	2

(b)

Median score (original 20 students)

46, 47, 48, 49, 53, 54, 56, 57, 58, 61, 63, 64, 67, 69, 71, 72, 78, 81, 85, 92.

Sorted scores: 46, 47, 48, 49, 53, 54, 56, 57, 58, **61**, **63**, 64, 67, 69, 71, 72, 78, 81, 85, 92.
With 20 values the average is the 10^{th} and 11^{th} values

$$\text{Median}=\frac{61+63}{2} = 62$$

List after adding 80 (21 values):

46, 47, 48, 49, 53, 54, 56, 57, 58, 61, 63, 64, 67, 69, 71, 72, 78, 80, 81, 85, 92

Number of values n=21 (odd).
Median position = $(\frac{n+1}{2})^{th}$ =11^{th} value

New Median = 63

Yes, Boris is correct. The median increases by 1 (from 62 to 63).

(c)

Yes, Boris is correct. The median increases by 1 (from 62 to 63).

Previously the median was the average of the 10th and 11th scores (61 and 63 → 62). Adding a single score of 80 (a value above the middle) shifts the middle position so the median becomes the old 11th value (63), which is larger than 62.