Name Key Date _____ Pd _____

3.3 Percentiles and 5# Summary WS

1. For the following sets of data, find the range and state the spread.

a) 6, 8, 11, 15, 24, 38

spread: 6 - 38 range: 38 - 6 = 32

b) 11, -6, -2, 16, 9, -8, 17, 19

spread: (-8) - 19 range: 19 - (-8) = 27

c) 6.4, 3.8, 5.9, 4.7, 5.3, 7.1, 3.2

spread: 3.2 - 7.1 range: 7.1 - 3.2 = 3.9

2. For the data below, find the median, and the upper and lower quartiles.

Data: 6, 47, 49, 15, 43, 41, 7, 39, 43, 41, 36

Ordered Data: 6, 7, 15, 36, 39, 41, 41, 43, 43, 47, 49

(Q_1 = 15, Median = Q_2 = 41, Q_3 = 43)

Median: 41

Q_3: 43

Q_1: 15

3. A year ago, Angela began working at a computer store. Her supervisor asked her to keep a record of the number of sales she made each month.

The following data set is a list of her sales for the last 12 months:

34, 47, 1, 15, 57, 24, 20, 11, 19, 50, 28, 37

1, 11, 15, 19, 20, 24, 28, 34, 37, 47, 50, 57

Use Angela's sales records to find:

a) The median $\frac{24+28}{2} = \frac{52}{2} = 26$

b) The range 57 - 1 = 56

c) The upper and lower quartiles $Q_1 = \frac{15+19}{2} = 17$ $Q_3 = \frac{37+47}{2} = 42$

(Q_3 Q_1)

d) The interquartile range (IQR)

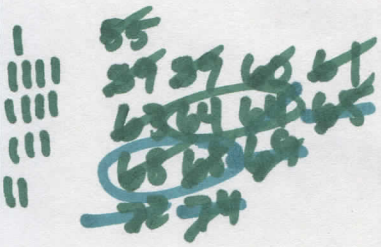
$IQR = Q_3 - Q_1$

$= 42 - 17$

$= 25$

4. The following data represent the heights (in inches) of 14 students in Ms. Warner's math class: 65, 63, 68, 59, 74, 59, 68, 61, 64, 60, 69, 72, 55, 64.

Interval	Frequency
55 – 58	55
59 – 62	59 59 61 60
63 – 66	65 63 64 64
67 – 70	68 68 69
71 - 74	74 72



a) Complete the table.
b) Which interval contains the median? 63-66 → 64
c) Which interval contains the upper quartile? 67-70 → 68
d) What percent of the students are shorter than 5 feet 7 inches?

$\frac{1}{14} = 0.0714 \Rightarrow$ 7.14%

5. Complete questions 1 – 15 for the data set below. Show work below for full credit for 1 – 15.

$i = \frac{k}{100}(n+1)$ k = %ile, i = rank

50 x values

No decimals. Always round ↑. 17.76 → 18

$R = 100\left(\frac{N_L + \frac{1}{2}N_t}{N_t}\right)$

N_L = # < than x

N_t = # = to x

N_t = Total # (50)

22	33	37	53	57	69	85	102	106	112
23	33	38	53	59	70	86	104	107	112
24	35	41	54	61	70	101	105	109	117
28	36	42	54	69	75	101	105	110	119
30	36	49	56	69	82	102	106	110	120

1. 63rd What is the percentile for 86?
2. 22.5 Find the 2nd percentile.
3. 69 Find the 2nd quartile. Q_2
4. 34 Find the 15% percentile.
5. 29th What is the percentile for 49?
6. 105 Find the 3rd quartile. Q_3
7. 110 Find the 88th percentile.
8. 105 Find the 75th percentile.
9. 45th What is the percentile for 61?
10. 83.5 Find the 60th percentile.
11. 41 Find the 1st quartile. Q_1
12. 73rd What is the percentile for 104?
13. 72.5 Find the 55th percentile.
14. 36.5 Find the 20th percentile.
15. 54th What is the percentile for 70?

1) $R = 100\left(\frac{31 + 0.5(1)}{50}\right) = 63$

2) $i = \frac{2}{100}(50+1) = 1.02$ $i_D = 1$ (22) $i_U = 2$ (23) $P_2 = 22.5$

4) $i = \frac{15}{100}(50+1) = 7.65$ $i_D = 7$ (33) $i_U = 8$ (35)

5) $R = 100\left(\frac{14 + 0.5(1)}{50}\right) = 29$

$$R = 100\left(\frac{N_L + 0.5N_i}{N_t}\right) \rightarrow \text{nearest whole}$$

no decimals
54.2 → 55
always round up

$$i = \frac{K}{100}(n+1)$$

i_D i_u $K = K^{th}$ percentile

i = index
n = total data

$$P_{74} = \frac{82+84}{2} = 83$$

$$\frac{88}{100}(51) = 44.88$$

44 45

$$\frac{75}{100}(51) = 38.25$$

38 39

$$100\left(\frac{22+0.5}{50}\right) = 45$$

$$\frac{60}{100}(51) = 30.6$$

30 31

82 85

$$100\left(\frac{36+0.5}{50}\right) = 73$$

$$\frac{55}{100}(51) = 28.05$$

28 29

70 75

$$\frac{20}{100}(51) = 10.2$$

10 11

36 37

$$100\left(\frac{26+0.5(2)}{50}\right) = 54$$