Name: _____ **Final Exam Review – 12**
Date: _____ **Stats – 02**

1. What is the **median**, the **mean**, and the **mean deviation** for the following set of data?

S = { ~~−6~~ , 14 , 17 , ~~−2~~ , 7 , ~~−4~~ }

mean $\frac{-6, -4, -2, 7, 14, 17}{6} = 4.\overline{3}$

median $\frac{-2+7}{2}$

$\frac{5}{2} = 2.5$

mean deviation

$-6 - 4.\overline{3} = -10.\overline{3} \to 10.\overline{3}$
$-4 - 4.\overline{3} = -8.\overline{3} \to 8.\overline{3}$
$-2 - 4.\overline{3} = -6.\overline{3} \to 6.\overline{3}$
$7 - 4.\overline{3} = 2.\overline{6} \to 2.\overline{6}$
$14 - 4.\overline{3} = 9.\overline{6} \to 9.\overline{6}$
$17 - 4.\overline{3} = 12.\overline{6} \to 12.\overline{6}$

$\frac{10.\overline{3} + 8.\overline{3} + 6.\overline{3} + 2.\overline{6} + 9.\overline{6} + 12.\overline{6}}{6} = \frac{49.9}{6} = 8.\overline{3}$

Median: 2.5

Mean: $4.\overline{3}$

Mean Deviation: $8.\overline{3}$

2. Consider the stem-leaf plot below showing the number of sit-ups students do in 30 minutes.

	Number of sit-ups	
0	3 3 7 8 9 9	6
1	0 0 0 1 4 6 7 7 7 8 9	11
2	0 1 1 2 3 4	6
3	0 2 3 6 7 8 9	7
4	0 4 6 6 9 9	6
5	1 2 9 9	4

40

How many sit-ups did a student do if they are ranked in the 24th percentile?

$\text{score} = \frac{\text{percentile}}{100} \times \text{total}$

$\frac{24}{100} \times 40 = 9.6$ round down

9

10 sit ups

3. A large company required its secretaries to write a French exam

Of the 265 secretaries who wrote the exam:

- Marianne is the only one who scored 139 points 1
- 176 secretaries scored fewer than 139 points
- 88 secretaries scored more than 139 points

In what percentile is Marianne's score?

$$\text{percentile} = \frac{\text{lower} + \frac{\text{equal}}{2}}{\text{total}} \times 100$$

$$\frac{176 + \frac{1}{2}}{265} \times 100$$

$$\frac{176.5}{265} \times 100 = 66.6 \text{ round up } 67$$

4. Consider the following table showing a two-variable distribution. Indicate the strength and direction of correlation.

X \ Y	[0,10[	[10,20[	[20,30[	[30,40[	[40,50[
20	0	0	0	0	3
40	0	0	0	9	0
60	0	0	7	0	0
80	1	6	0	0	0
100	3	0	0	0	0

<u>Strength</u>

☐ Weak

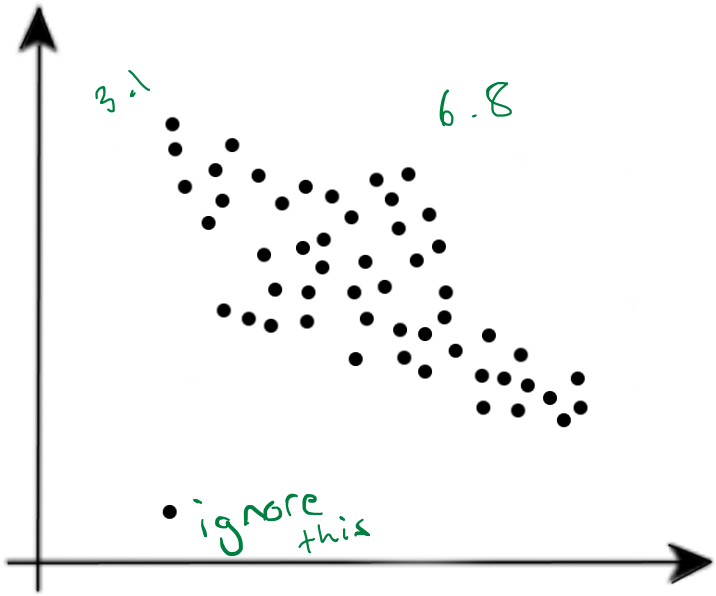
☑ Strong

<u>Direction</u>

☐ Positive

☑ Negative

5. *What is the linear correlation coefficient of the scatter plot below (give a number)?*



$r = 1 - \frac{\text{short}}{\text{long}}$

$r = 1 - \frac{3.1}{6.8}$

$r = 1 - 0.46$

$r = 0.54$

-0.54

r = -0.54

6. The table below shows the linear correlation coefficients between the two variables of three different statistical distributions.

Distribution	r
1	-0.82
2	-0.42
3	0.63

high

low

Which of the following presents these distributions, in order, from weakest to strongest linear correlation?

2, 3 1

A) 1, 2, 3

B) 1 , 3, 2

C) 2, 3, 1

D) 3, 2, 1

7. A music school awards scholarships to students who have done well over the past school year. This year, there are 8 piano students at the school.

The year end mark of each piano student is given below:

86 86 86 88 88 94 96 96

two people get the scholarship

In order to get a scholarship, the piano student's year-end mark must meet the following two criteria:

Criterion A:

The piano student's mark ≥ 86 + mean deviation of the 8 piano student marks. → 86+4=90

Criterion B:

The piano student's mark must be greater than the 90th percentile when looking at all music student marks at the school.

95 +

This year, there are 119 music students at the school.
All music student marks are displayed below:

YEAR-END MARKS OF THE 119 STUDENTS IN THE MUSIC SCHOOL

Tens	Units	
5	0, 0, 0, 1, 1, 2, 2, 2, 3, 3, 3, 4, 4, 5, 5, 5, 5, 5, 5, 6, 7, 8	22
6	0, 0, 0, 2, 2, 2, 3, 3, 4, 4, 4, 4, 5, 5, 6, 7, 8, 8, 8, 9, 9, 9, 9, 9, 9	25
7	0, 1, 1, 1, 2, 2, 3, 3, 3, 3, 4, 4, 4, 5, 5, 5, 5, 5, 5, 5, 6, 7, 7, 7, 7	25
8	0, 1, 1, 1, 1, 2, 2, 3, 4, 4, 5, 6, 6, 6, 6, 7, 7, 8, 8, 8, 8, 8, 8, 8, 9	25
9	0, 0, 0, 1, 2, 2, 3, 4, 5, 5, 5, 5, 5, 6, 6, 6, 7, 8, 8, 8, 9, 9	22

How many piano students get a scholarship this year?

mean deviation

$\frac{86+86+86+88+88+94+96+96}{8}$

mean = 90

86-90 = -4 → 4
86-90 = -4 → 4
86-90 = -4 → 4
88-90 = -2 → 2
88-90 = -2 → 2
94-90 = 4 → 4
96-90 = 6 → 6
96-90 = 6 → 6

$\frac{4+4+4+2+2+4+6+6}{8}$

$\frac{32}{8} = 4$

score = $\frac{\text{percent}}{100} \times \text{total}$

$\frac{90}{100} \times 119$

score = 107 = 95

95 and over