**Main Problem #11**

Topic: *Comparing Decimals*

Problem: After reviewing last week’s math scores, your teacher decided to give you all a second chance by retaking another “Decimals” exam. The same 15 people took the exam and all their new scores, converted from percentage to decimals, are located in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| You | Jake | Jack | Jimmy | John |
| 0.95 | 0.81 | 0.84 | 0.78 | 0.50 |
| Paul | Pablo | Patrick | Priscilla | Paula |
| 0.74 | 0.92 | 0.61 | 0.52 | 0.89 |
| Kevin | Kyle | Khloe | Kim | Karl |
| 0.85 | 0.53 | 0.91 | 0.79 | 0.86 |

Q1. Order all the students from least to greatest according to their decimal score.

Q2. If your teacher were to give everyone a “Points Boost” based on the difference between 100% (in this case 1.00) and the highest score, how much would the point boost be?

Q3. Based on your answer to Q2, recreate the new table. Will the order of students from Q1 change? Justify answer with an explanation.

Q4. Create lists of all the people who got an A (90 to 100), B (80-89), and C (70-79) according to their new scores.

A1. The best approach to this problem would be to keep tab (or a dictionary) of everyone’s score according to the digit in the tenths place. The example below shows scores in ordered within their category.

0.90’s: Khloe, Pablo, You

0.80’s: Jake, Jack, Kevin, Karl, Paula

0.70’s: Paul, Jimmy, Kim

0.60’s: Patrick

0.50’s: John, Priscilla, Kyle

Answer: John, Priscilla, Kyle, Patrick, Paul, Jimmy, Kim, Jake, Jack, Kevin, Karl, Paula, Khloe, Pable, You

A2. Difference between 1.00 and the highest scores (0.95) is 0.05. Therefore a 5% point boost.

A3. The order of students will not change despite the point boost because all scores will retain the same difference in distances between each other. If you think of this as a number line, then you would notice that the scores have a certain *x* amount of difference between each other. With an increase or decrease in all scores, the same difference remains.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| You | Jake | Jack | Jimmy | John |
| 1.00 | 0.86 | 0.89 | 0.83 | 0.55 |
| Paul | Pablo | Patrick | Priscilla | Paula |
| 0.79 | 0.97 | 0.66 | 0.57 | 0.94 |
| Kevin | Kyle | Khloe | Kim | Karl |
| 0.90 | 0.58 | 0.96 | 0.84 | 0.91 |

A4. Using our answer in A3, we can create the grades list.

|  |  |
| --- | --- |
| A (90-100) | You, Pablo, Paula, Khloe, Karl |
| B (80-89) | Jake, Jack, Jimmy, Kim |
| C (70-79) | Paul |