MGF 1106 – Section 13.5B
Mean, Median, Mode and Midrange, and Percentiles

A. Working Backwards: Given an incomplete set of data, determine the additional value required to create the desired measure of central tendency.

1. Data: 94 96 87 92
   Mean = 93, additional value =________   Midrange = 93, additional value =________

2. Grades: 86 81 79 88 83
   Mean = 83, additional value =________   Midrange = 81, additional value =________

B. Weighted averages – To calculate the mean (only) multiply each score by its "weight" in decimal form, then add the results to determine the average.

A student is taking an English class. The method of grading is given below.

   2 tests @ 25%
   1 oral presentation @ 15%
   1 research paper @ 20%
   3 in – class essays @ 5%
   Total = 100%

What is the weighted average if the student makes 60 and 85 in the tests, 75 on the oral presentation, 50 on the research paper, and 92, 87, and 80 on the essays?

C. Measures of "Location" – Percentiles
A percentile is the value that a certain percent of the population scores below. For example, if the 17th percentile is 82, then 17 percent of the class scored lower than 82. Standardized tests use percentiles to report scores. For example, if your score is in the 92nd percentile, then 92% of those taking the test has scores lower than yours. The Median of a set of data is always the 50th percentile, and the 25th, and 75th percentiles are referred to as quartiles.

Example: On the last semester exam, the following statistics were determined:

   Mean  82  First quartile 70
   Median 74  Third quartile 90
   Mode  86  87th percentile 93

1. What is the most common grade?
2. What grade did half the students surpass?
3. About what percent of the students made A's (93 = A).
4. About what percent of the students surpassed 90?

D. Percentiles given in a data table -

<table>
<thead>
<tr>
<th>Test Score</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>.92</td>
</tr>
<tr>
<td>85</td>
<td>.83</td>
</tr>
<tr>
<td>80</td>
<td>.71</td>
</tr>
<tr>
<td>75</td>
<td>.58</td>
</tr>
<tr>
<td>70</td>
<td>.47</td>
</tr>
<tr>
<td>65</td>
<td>.38</td>
</tr>
</tbody>
</table>

HW: 13.5 Problems 30, 31, 36, 37, 43-47, 49