

**GRADE 12 APPLIED
WORKSHEET
PERCENTILE RANK AND TRIMMED MEANS**

Name: _____

Date: _____

Show work (neatly) for full marks. *Round* to nearest 0.01 (as always) unless otherwise indicated or appropriate.

1. Determine whether the following statements are **True** or **False**. **Circle** the **T** or **F** accordingly.

a) The higher the percentile rank of a score, the greater the percent of scores above that score. T / F

b) A mark of 75% always has a percentile rank of 75. T / F

c) A mark of 75% might have a percentile rank of 75. T / F

d) It is possible to have a mark of 95% and a percentile rank of 40. T / F

e) The higher the percentile rank, the better that score is compared to other scores. T / F

f) A percentile rank of 80, indicates that 80% of the scores are above that score. T / F

g) P_{50} is the median. T / F

h) Two equal scores will have the same percentile rank. T / F

2. The following is a set of 30 scores achieved by students on an exam:

18, 23, 33, 38, 38, 38, 42, 51, 55, 56,
57, 63, 65, 66, 68, 68, 68, 68, 76, 80,
81, 82, 85, 89, 92, 93, 93, 95, 97, 100

a. Determine the percentile rank for each of the following scores. (Remember to round all percentiles up to the next whole number)

a) 23

b) 68

c) 95

b. Determine the Quartile rank in which the 23 and also the 68 fall.

3. A total of 700 individuals take a government employment exam. Carmela scores 618 out of 800 marks. There are 520 individuals who score less than 618 marks and no one else has a score of 618.

a) Find Carmela's percent score on the exam.

b) Find Carmela's percentile rank comparing her to others.

c) In order to get a job with the government an individual has to be in the top 20% of people writing the exam. Will Carmela get a job? Explain in a proper paragraph.

4. Shana's final mark in her Grade 12 math class is 92%. Of the total 28 students in her class, three others received the same grade as Shana and 22 have lower marks.

- a) Find Shana's percentile rank.
- b) What percentage of students have a final mark higher than Shana?

5. The examination results of 4000 students on a provincial exam are analyzed and the following percentiles are calculated: *(drawing a picture helps)*

$$P_{20} = 45; P_{50} = 61; P_{75} = 81; P_{90} = 94$$

- a) Approximately what **percentage** of students has a score of 45 or less?
- b) Approximately what **percentage** of students scored more than 81?
- c) Approximately what **percentage** of students have scored between 61 and 94?
- d) Approximately **how many students** scored more than 81?
- e) What is the **median** mark for this provincial exam?

6. Ben has a final overall Grade 12 average of 87%. The college he wants to attend will not consider any applicant with a percentile rank below 82. Can Ben be sure the college will consider his application? Explain using a proper paragraph.

7. Calculate the 20% trimmed mean (20% trimmed from each end) for the values 4, 90, 43, 54, 48.

8. Chad is applying to a **Mathematics** and **Science** Program at the University of Waterloo. He earned grades of **85**, 95, **79**, 80 and **50** in the subjects **Mathematics**, Statistics, **Physics**, Biology and **English** respectively. The University uses a **weighted mean** to determine his qualification grade. The weights for each subject are **5**, 4, **3**, 2, and **1** respectively for the above mentioned grades since obviously math and science marks count more than English if doing Math and Science. Calculate Chad's weighted average for admission to the program.

Answers:

1. a) F b) F c) T d) T e) T f) F g) T h) T

2.a) 1 or 1st or P_1 b) 54 or 54th or P_{54}

3. a) 77.25% b) 75 or 75th place or P_{75} c) No, she just missed the cutoff, her rank is 75, she needed a rank of 80 to be in top 20%.

4. a. P_{86} ; 86, 86th place, etc. b) $\sim 14\%$ have a better mark

5. a. 20% b. 25% c. 40% d. 1,000 students

e. Median = $P_{50} = 61$

6. Depends on how he compares with the all the others. We do not know his rank, so we cannot say whether he will be accepted. An 87% for a course mark sounds good; but there may be a lot of 'smarter' more mathematically inclined students applying.

7. 48.33

8. 83.47