GRADE 12 APPLIED
UNIT D – STATISTICS
PERCENTILE RANK

Name: _____
Date: _____

Your percentile rank is just the **position** you would be in a hundred-dog sled team. So, it compares you to everyone else.

The formula to calculate your percentile rank is:

Percentile Rank 'P' $= \dfrac{B + \frac{1}{2}E}{n} * 100$; where the **B** is the number of data **B**elow your '*x*' (some measured value), **E** is the number of data **E**qual to your '*x*'; and '**n**' is the number of data.

Or you can sometimes work it backwards; for example P_{50} would be the value, **x** (some number or measure), that has a percentile rank of 50.

1.   Donna's newborn child has a mass of 3108 grams. She wants to know how her child compares with others. The doctor says that she has delivered 45 babies this year, your child is the only 3108 g baby she has had and there were 15 babies smaller than hers. What is the percentile rank of Donna's baby?

2.   Lance is on a hockey team. The coach measures the height of all 26 members of the team. Lance and two others have a height of 165 cm. Seven team members are taller.

    a.   What is Lance's percentile rank?
    b.   What percentage of the team is shorter than Lance.

3.   Westy is in a marathon of 2560 runners. He does the course in **2hrs : 18min : 15sec**.   813 runners had a '*better*' time than Westy.

    a.   What is Westy's percentile rank in the marathon?
    b.   If the runner having a percentile rank of 50 (P_{50}) had a time of 2hrs: 30:mins : 12 sec ; what percentage of people had a time *better* than 2hrs : 30 mins : 12 sec?

4.   Kyle has an annual gross income of $32K. Kyle makes $17.85 per hour and works 36 hours a week. He checks the Statistics Canada website for census data to find out the distribution of personal annual income in his area. He notices that in his area there were 13,020 people in the census, he sees that 9,000 people had an income lower than his, and 210 were in the same $32K category as him.

     a.   what is Kyle's percentile rank with respect to his income?

5.   In the question above the census data show that the P_{25} (25th percentile rank) is $22K, the P_{50} is $26K, and the P_{75} is $45K.

     a.   what percentage of people make less that $22K?
     b.   what percentage of people make between $22K and $45K?
     c.   what is the median income of the people in this census region?
     d.   what percentage of people make more than $45K?

6.   Mike wrote an entrance exam for Business College. He got a score of 47 marks out of a total of 54 possible. 320 people wrote the exam.   Mike and 32 others had the same score. 241 people had a score lower than 47 marks on the exam. He needs to have a percentile rank of at least 85 to be accepted to the college.

     a.   what is Mike's percentage on his entrance exam?
     b.   what is Mike's Percentile Rank?
     c.   will Mike be accepted to the business college?