GRADE 12 ESSENTIAL
UNIT C - STATISTICS
ARCIVED EXAM QUESTIONS

Name:_____
Date: _____

JAN 2016

JAN 16-31. DBG Manufacturing has 50 employees. The following table shows employee salaries:

Position	Number of Employees	Salary
President	1	$700 000
Managers	3	$100 000
Sales Staff	30	$50 000
Administration	4	$40 000
Maintenance	5	$37 000
Secretaries	7	$35 000

A) State the mode of the salaries.
B) State which measure of central tendency is most affected by removing the president's salary. Justify (explain) your answer.

ANS: A) $50 000 B) Mean

JAN16-32. Connor scored 18/20 on a math test. His mark put him in the 15th percentile. Justify what his percentile rank indicates about the math test.

ANS: The test was done very well because 85% of the class scored above 18/20. Or the test was too easy !!!

JAN16-33. Ryan has just finished writing a statistics test. There are 40 students in his class and 30 students scored less than Ryan. Calculate Ryan's percentile rank.

ANS: PR 75 or 75th or PR_{75}

JAN 16-34. Juanita took a Physics course. The following table shows the marks she earned for a project and the weight for each category:

Category	Mark (%)	Weight (%)
Theories	90	40
Communication	60	10
Calculations	70	50

A) Calculate Juanita's final mark for the project using a weighted mean.

B) If Juanita wanted to improve her overall grade, state in which category she should focus her efforts. Justify (explain) your answer.

ANS: A) 77%   B) Calculations, because they are weighted most heavily

JUN 2016

JUN 16 - 32. Nikolai received a test score of 84%. He was told he scored in the 95th percentile.
A) Explain what his test score indicates.
B) Explain what his percentile rank indicates.

ANS:

JUN 16 - 33. Athena is trying to calculate her final mark on her test. The table below shows the percent she received and the weightings for each category.

Category	% correct	Weight
Multiple choice	87%	50%
Short answer	61%	20%
Long answer	68%	30%

Calculate Athena's final mark using a weighted mean.

ANS: 76.1%

JUN 16 - 34. The following set of data represents the number of homeruns hit by 9 players on a baseball team:

62	14	25	7	48	31	14	47	4

State the mean, median, and mode.
     Mean: _____
     Median: _____
     Mode: _____

ANS: 28, 25, 14

JUN 16 – 35. Jimbo has the following marks on his tests:

41%	78%	84%	69%	75%

A) Explain why he might ask that his test mark be calculated using a trimmed mean.
B) Calculate his trimmed mean if the teacher agrees and trims his highest and lowest test marks.

ANS: A) B) 74%

JUN 16 – 36. Choose the letter that best completes the statement below.

The measure of central tendency that is most affected by outliers is:
     a) mode
     b) mean
     c) median
     d) trimmed mean

ANS) b)Mean

JAN 2017

Jan 17 – 33. Mathville has a population of 1 200 000 people and Megatropolis has a population of 3 108 000 people. The following table shows the percentage of people who speak English as their first language.

	Population	% of people who speak English as a First Language
Mathville	1 200 000	84.6%
Megatropolis	3 108 000	65.3%

Calculate the percentage of people who speak English as their first language in both cities combined using a weighted mean.

ANS: 70.68%

Jan 17 – 34. In a school, 236 students wrote a test. Jesse scored 60 out of 93 on the test and 127 students scored lower than him.

A) State Jesse's percentile rank.
B) State Jesse's mark as a percentage

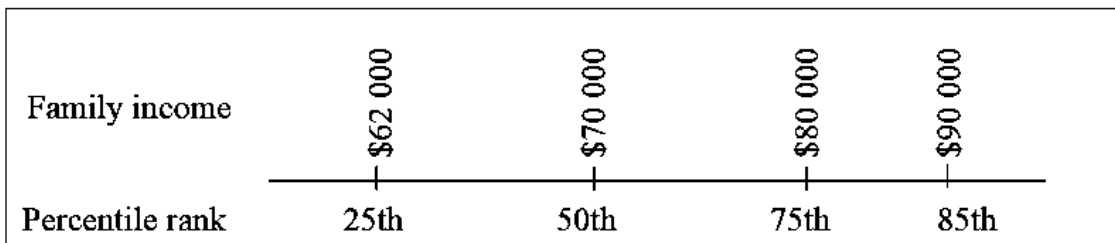Ans: A) 54 or 54th or P_{54} B) 64.52%

Jan 17 – 35. Braedon is a Winnipeg real estate agent who has sold 6 houses in the last 5 weeks. The selling prices were as follows:

$250 000	$375 000	$1 877 000	$275 000	$87 000	$400 000

A) State the mean.
B) State the trimmed mean by removing the highest and lowest values
C) Justify (explain) which mean would be a better indicator of the average selling price of a house in Winnipeg.

Ans: A) $544 000   B) $325 000   C) The trimmed mean would be the better indicator of the average selling price because the outliers (highest and lowest price) significantly change the overall average

The following statistics are available on family income for a community:

Family income	$62 000	$70 000	$80 000	$90 000
Percentile rank	25th	50th	75th	85th

State the percentage of people who earn between $62 000 and $90 000.

ANS: 60%

JUN 2017

JUN 17 - 34. Doug is a welder who is looking for employment. Hourly rates for available jobs are shown in the table below:

$22.50	$29.50	$18.50	$26.75	$26.75	$17.59	$26.75
$26.75	$28.25	$17.50	$24.25	$18.50	$24.00	$26.75

A) State the mean hourly rate.
B) State the mode of the hourly rate.

C) Explain why the mode may be a better indicator than the mean of the hourly rate Doug could expect.

ANS: A) $23.88   B) $26.75 C) It is more common

JUN 17 - 35. The table at right indicates the hours (per week) that each student in a band practices their instrument.

Calculate Beth's percentile rank for the time she spends practising her instrument.

Practice	
Student	**Hours per Week**
Anna	0.25
Beth	2.5
Cassie	3.0
Dave	0.5
Ed	1.5
Fiona	1.25
Gordon	1.75
Hanna	2.0

ANS: 75 or 75th or PR_{75}

JUN 17 - 36. Choose the letter that best completes the statement below.

Removing a high outlier:

A) increases the mean   B) lowers the mean
C) has no effect on the mean D) increases the median

ANS: B)

JUN 17 - 37. The test results from Jeremy's Statistics course are listed below.

Test Results	50%	65%	70%	95%	40%	55%

His final grade in the course will be calculated using a trimmed mean. Calculate Jeremy's final grade after eliminating his highest and lowest test mark

ANS: 60%

JUN 17 - 38. Megan is taking a Psychology class at university. The table below shows her marks and their corresponding weights.

Category	Average Mark (%)	Weight (%)
Projects	75	10
Assignments	85	30
Tests	73	40
Exam	?	20

Calculate the mark Megan needs on her final exam to receive a final course mark of 80%.

ANS: 89%

JAN 2018

JAN 18 – 37. Marc must write an entrance exam to enter university. He must receive a minimum grade of 75% to be accepted.

Last year his mark was in the 70th percentile. He was not accepted. This year his mark is in the 80th percentile.

Justify why it cannot be determined if Marc will be accepted into university this year.

ANS: It cannot be determine if Marc will be accepted this year since his grade on the exam is not indicated

JAN 18 – 38. Financial institutions use credit scores to decide whether people qualify for a loan.

Below is a list of credit scores for people applying for a bank loan

620	655	706	722	722
768	775	778	780	784
784	800	803	816	824
824	831	840	849	852

Calculate the percentile rank for a credit score of 800.

ANS: 55 or 55th or PR$_{55}$

JAN 18 – 39.   Réjean entered one of his paintings in the provincial art show. The table below shows the points he received and the weight of each category.

Category	Points Received (out of 100)	Weight
Originality	92	35%
Design	87	40%
Colour	77	25%

Calculate the final score on Réjean's painting using a weighted mean

ANS: 86.25 points

JAN 18 – 40. A store sells shoes with sizes ranging from 7 to 12. The following table shows sales for the last month.

Size	Quantity Sold
7	5
8	20
9	25
10	43
11	5
12	2

Choose the letter that best completes the sentence below.

The measure of central tendency that represents the most popular shoe size is:

A) mean   B) median   C) mode   D) weighted mean

ANS: C)

JAN 18 – 41. Environment Canada recorded the following maximum daily temperatures for Thompson for one week in October 2016.

Maximum Daily Temperature

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1.70°C	3.40°C	−5.90°C	0.10°C	1.80°C	7.10°C	2.60°C

A) Calculate the mean temperature for the week

B) Calculate the trimmed mean temperature for the same week by removing the highest and lowest temperatures

ANS: A) 1.54°C   B) 1.92°C

JAN 18 – 42. Sidi works as a sales clerk at Cycle Sports. During the first 12 days of the month, the store sold the following numbers of bikes:

16	32	27	19
19	23	19	32
25	20	35	33

Calculate the median and the mode of this data.

Median: _____ bikes

Mode: _____ bikes

ANS: 24 , 19

JUN 2018

JUN 18 – 37. A school group went on a weekend ice fishing trip. The following table shows how many fish each student caught and released:

Name	Number of Fish Caught and Released
Jin	45
Sue	16
Dave	13
Tyson	40
Bob	39
Alexa	13

Calculate Sue's percentile rank.

ANS: 34 or 34th or PR_{34}

JUN 18 – 38. A group of 20 students fundraised a total of $3000 for a local charity.

A) Calculate the mean amount of money fundraised by each student.
B) The median amount raised by the group is $120. Explain why eliminating the highest and the lowest amounts fundraised will not affect the median amount.

ANS: A) $120 B) The omitted amounts will not affect the median because an equal number of values from each side was omitted

JUN 18 – 39. A golf course located near a shopping center may be expanded. A survey is conducted at two locations to determine the percentage of people in favour of the expansion. The table below shows the results of the survey

Survey Location	Percentage in Favour	Weight
Golf Course	95%	20%
Shopping Centre	35%	80%

Calculate the weighted mean of the percentage in favour of the expansion of the golf course.

ANS: 47%

JUN 18 – 40. The table shows the amount of bushels per ton of various crops grown in Manitoba
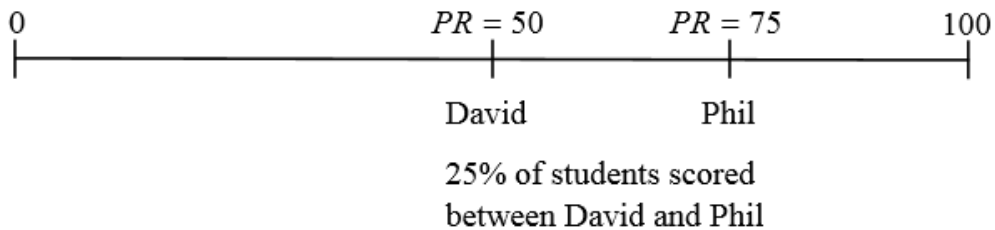
Calculate the trimmed mean (bushels per ton) of the various crops by eliminating the two highest and the two lowest values.

Crop	Bushels per Ton
Barley	45.93
Corn	39.37
Oats	68.89
Soya beans	36.74
Wheat	36.74
Sunflower	73.49
Canola	44.09

ANS: 43.13

JUN 18 – 41. In a math class, David received the median score on his math test. Phil's score was at the 75th percentile. No students received the same score.

State the approximate percentage of students who received a score between David's and Phil's.

ANS: 25%

0                      $PR = 50$ $PR = 75$ 100

                         David   Phil

25% of students scored between David and Phil

JUN 18 – 42. Choose the letter that best completes the statement below.

Removing a low outlier:

    A) decreases the mean   B) increases the mean

    C) has no effect on the mean   D) decreases the median

ANS: B)