JAN 2018

DEPARTMENT OF MATHEMATICS

PROBLEM SOLVING CHALLENGE

Q1. *Junior Cycle*

a) The median of five pieces of data is 10. The mode of this data set is the same as the median. The range of these five values is 12. If the mean of these five values is 11 write down all five values from lowest to highest.

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b) Each of piece of data is 4 larger than the one previous when ordered from smallest to largest. If the mean of these five values is 20 list these values.

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Q2. *Senior Cycle*

a) Prove the change of base formula for logarithms: $\log_b a = \frac{\log_d a}{\log_d b}$

(Hint, let $\log_b a = y$ *and* $b^y = a$*)*

b) Hence or otherwise prove that: $\frac{1}{\log_b a} = \log_a b$

c) Using the above laws find the value of a for which $\frac{1}{\log_2(a)} + \frac{1}{\log_{1009}(a)} = 1$

Answers on an A4 sheet with your Name, Year and Class should be given to Mr. McManus or to Mr. McEvoy in room 33 before 4pm on Wednesday 31st of January.

*Monthly Prize for both Junior and Senior Cycle.**

Good Luck.

Junior Cycle students answer question 1 only. *Senior Cycle students answer question 2 only*