Name: Class: ................

Mathematics teacher:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Provide the following definitions.   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  | | f |  |  1. The difference of sets A and B (:   ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………   1. Circumference angle:   ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………   1. Composite number:   ……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………… |
| 2. | Provide the following theorems.   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  |  1. The converse of the Thales’ Theorem:   ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………   1. The theorem dealing with the mid-lines of a triangle:   ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………   1. The theorem dealing with the sum of the interior angles of a convex polygon:   …………………………………………………………………………………………................................................................................................................................................................................................................................................................................... |
| 3. | Define the arithmetic mean and the geometric mean of two non-negative real numbers.   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  | | f |  | | g |  | | h |  | | i |  |  1. Arithmetic mean: ……………………………………………………………………...   …………………………………………………………………………………………   1. Geometric mean: …………………………………………………………………..…   ………………………………………………………………………………………...  What connection is there between the arithmetic mean and the geometric mean? Prove.  *Connection (statement):* …….………………………………………………………………………………………………………………………………………………………………………………………  *Proof:* |
| 4. | How can you construct the centre of the circumscribed circle of a triangle?   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  | | f |  | | g |  | | h |  |  1. Write down the steps of the construction. (You do not have to construct it.) 2. Prove the theorem dealing with the circumscribed circle of a triangle. |
| 5. | True or false? Why?   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  |   *„If a natural number is divisible by 4 and 6, then it is also divisible by 24.”*  Converse the former statement. Is the converse true or false? Explain.  *The converse:*……………………………………………………………………………………  *…*…………………………………………………………………………………………………...   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  | | f |  | | g |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. | List statistical elements (data) for which all the following statements are true:   * the data contain ten integers; * the data do not contain number 7; * median of the data is 7; * the mode of the data is 9; * the difference between the greatest number and the smallest one is 6.   The elements arranged in increasing order:   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |  |   Which is the most frequent element? ....................................  What is the relative frequency of this element? …………….. |
| 7. | Which statement is true (T) and which one is false (F). Write T or F into the appropriate box. If necessary you can use the coordinate system below.   |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  | | f |  | | g |  | | h |  | | i |  | | j |  |  |  |  | | --- | --- | | a |  | | b |  | | c |  | | d |  | | e |  | | f |  | | g |  |  |  |  | | --- | --- | | ***Statements*** | ***T/F*** | | 1. The co-domain of a function can be an empty set. |  | | 1. If we plot the graphs of and in a common coordinate system, then the two graphs are the same, if the domain of both functions is the set of integers. |  | | 1. The intersection of any two sets is the subset of the union of the same two sets. |  | | 1. If the lengths of the non-parallel sides of a trapezoid are the same, then this trapezoid is a circumscribed quadrilateral. |  | | 1. In a circle with a radius r there is a central angle, which has an arc whose length is 6r. |  | | 1. There is a 240° rotation about a certain point with which a regular 12-gon remains unchanged. |  | | 1. It is true for any side of a triangle that it is not greater than the sum of the other two sides. |  | | 1. If the square root of an integer is an integral number, then the cube root of the same number is an irrational number. |  | | 1. If the product of the roots of a quadratic equation is 0, then the sum of the roots is also 0. |  | | 1. The length of the sum of two non-zero vectors can be equal to the length of the difference of the same two vectors. |  | |