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

Mathematics teacher:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Provide the following definitions.

|  |  |
| --- | --- |
| a |  |
| b |  |
| c |  |
| d |  |
| e |  |
| f |  |

1. The difference of sets A and B ($A∖B)$:

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………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 $f\left(x\right)=\sqrt{x^{2}}$ and $g\left(x\right)=x$ 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.
 |  |

 |