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

Mathematics teacher:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Give the domain of the following expression. Carry out the operation and simplify your final result.

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

$$\frac{3a^{2}+a}{3a^{2}-a}∙\frac{9a^{2}-1}{9a^{2}+6a+1}=$$ |
| 2. | Solve the following inequalities in the set of real numbers.

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

1. $\left|2x\right|\leq 16 $
2. $\sqrt{x^{2}}>0$
3. $\frac{x^{2}+25}{5-x}\leq 0$
 |
| 3. | Draw a 45° central angle in a circle whose radius is 10 cm. Connect the endpoints of the arc with a line segment. Find the distance between this chord and the centre of the circle.

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

 |
| 4. | Find the ***y-***intercept of the following functions. If the function does not have a ***y-***intercept then write ’It does not exist’ on the dotty line.

|  |  |
| --- | --- |
| a |  |
| b |  |

1. $f\left(x\right)= 2x-3$ y = ………………
2. $h\left(x\right)=\frac{2x^{2}}{x}$ y = ……………...
 |
| 5. | Find the ***x-***intercept of the following functions. If the function does not have an ***x-***intercept then write ’It does not exist’ on the dotty line.

|  |  |
| --- | --- |
| a |  |
| b |  |

1. $f\left(x\right)=-x+\sqrt{2}$ x = …………….
2. $h\left(x\right)=\sqrt[3]{x}+1$ x = …………….
 |
| 6. | The difference between the two legs of a right triangle is 7 cm, and the area of the triangle is 60 cm2.

|  |  |
| --- | --- |
| a |  |
| b |  |
| c |  |
| d |  |
| e |  |
| f |  |
| g |  |
| h |  |
| i |  |
| j |  |
| k |  |

1. Find length of the legs and the hypotenuse.
2. Calculate the radius of the circumscribed circle.
3. Find the distance between the centroid and the vertex of the right angle.
 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. | A test was written by a class and the total was 50 points. The results of the 27-member class were put into the following table:

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

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total score | 50 | 46 | 44 | 40 | 39 | 35 | 27 | 18 | 13 | 11 | 10 |
| Frequency | 2 | 3 | 4 | 3 | 2 | 3 | 5 | 1 | 2 | 1 | 1 |

1. Find the arithmetic mean of the scores. Round your result to the nearest tenth.

Arithmetic mean: ……………… An excursion was organized for only those students who have gained at least 70 % of the total points. How many students could participate in this excursion? ………………………………1. Draw a pie chart containing the students who have participated in this excursion and those who have not. Give the central angles of the two circular sectors.

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| 8. | The sum of the two roots of a quadratic function $f\left(x\right)=x^{2}+bx+c$ is . The product of the roots is $12.$

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

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

1. Find the values of the coefficients *b* and *c* in the set of real numbers.
2. Plot the graph of the former function $f\left(x\right)$, if the domain of the function is $\left]1;7\right]$.

1. Describe the function $f(x)$, if the domain is $\left]1;7\right]$.

range: …………………………….minimum: ……………………………….upper limit: ……………………………. |