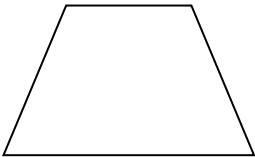
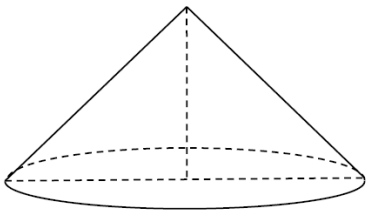
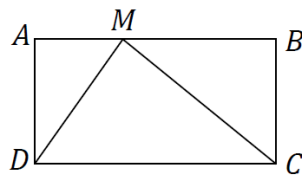


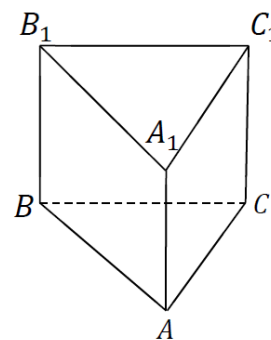
No.	Items	Score	
ALGEBRA			
1.	Calculate $\sqrt[3]{-\frac{1}{64}} + \left(\frac{2}{3}\right)^{-2}$. <i>Solution:</i>	L 0 1 2 3 4 5	L 0 1 2 3 4 5
<i>Answer:</i> _____.			
2.	Show that the value of the expression $\log_{\sqrt{2}} 20 + \log_{0,5} 25$ is a perfect square. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
3.	Determine the complex numbers z, such that $\begin{vmatrix} z & 2iz \\ 1 & 3 \end{vmatrix} = 2 + 3i$, where $i^2 = -1$. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
<i>Answer:</i> _____.			

4.	In a city, the fares for bus and trolleybus trips are fixed, as is the cost of a taxi ride. Two bus trips and two trolleybus trips cost 32 lei; three trolleybus trips and one taxi ride cost 78 lei; one bus trip, two trolleybus trips and one taxi ride cost 82 lei. Determine the fare for one bus trip, the fare for one trolleybus trip and the cost of one taxi ride. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
<i>Answer:</i> _____.			
5.	Determine the real values of m , such that the real solutions of the equation $x^2 + x - m^2 + m = 0$ are less than 2. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
<i>Answer:</i> _____.			

GEOMETRY				
6.	In a trapezoid, the longer base is 6 cm and the midline is 5 cm. Determine the area of the trapezoid if its height is congruent to its shorter base. <i>Solution:</i>		L 0 1 2 3 4 5	L 0 1 2 3 4 5
<i>Answer:</i>_____.				
7.	In a right circular cone, the slant height is 1 m and the area of the lateral surface is equal to $6000\pi \text{ cm}^2$. Determine the volume of the cone. <i>Solution:</i>		L 0 1 2 3 4 5	L 0 1 2 3 4 5
<i>Answer:</i>_____.				
8.	In the rectangle $ABCD$, the point M lies on the side AB, so that $m(\angle AMD) = m(\angle BCM) = 60^\circ$. Determine the perimeter of the rectangle $ABCD$ if it is known that $AM = 2 \text{ cm}$. <i>Solution:</i>		L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
<i>Answer:</i>_____.				

9. The base of the right prism $ABCA_1B_1C_1$ is the isosceles triangle ABC , where $AB = BC = 13$ cm and $AC = 10$ cm. Determine the area of the lateral surface of the prism $ABCA_1B_1C_1$, if it is known that the distance from the vertex B_1 to the edge AC is equal to 20 cm.

Solution:



Answer: _____.

FUNCTIONS

10. Consider the function $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = \frac{x}{2-\sqrt{3}} + \sqrt{48}$. Determine, if the point $M(-2\sqrt{3}; -6)$ lies on the graph of the function f .

Solution:

Answer: _____.

11.	Consider the function $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = (-3a^2 - 11a + 4)x + 8$. Determine the real values of a, such that the function f is strictly increasing on $\mathbb{R}$. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
12.	In an amphitheatre, the first row has 10 seats. Each row, starting from the second, has 2 more seats than the previous row. The amphitheatre has 630 seats in total. Determine the number of seats in the last row. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8
<i>Answer:</i> _____.			

ELEMENTS OF COMBINATORICS, MATHEMATICAL STATISTICS, FINANCIAL CALCULUS AND PROBABILITY THEORY					
13.	A vase contains 6 red roses and 7 white roses. Five roses are taken at random. Determine the probability that at least two roses of each colour are taken. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8		
	<i>Answer:</i> _____.				
14.	The number of steps (expressed in thousands) taken by a teenager during 8 days was: 6, 9, 8, 12, 13, x , 9, 7. The average value of the number of steps taken by the teenager during the 8 days is equal to 9 (thousand). Determine the value of x and the median of the corresponding statistical series. <i>Solution:</i>	L 0 1 2 3 4 5 6 7 8	L 0 1 2 3 4 5 6 7 8		
	<i>Answer:</i> _____.				

$$C_n^m = \frac{n!}{m!(n-m)!}, \quad 0 \leq m \leq n$$