EASY SOLUTION OF SOME GEOMETRIC PROBLEMS

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ABSTRACT

The main point is the enrichment of the spatial imagination of the readers with the idea of creating new ideas and ideas.

РЕЗЮМЕ

Главное-обогатить пространственное воображение читателей идеей создание новых идей и идей.

Key words: *bisector, median, trapeziod, similarity, height, vertical angles, arc, parallel straight lines.*

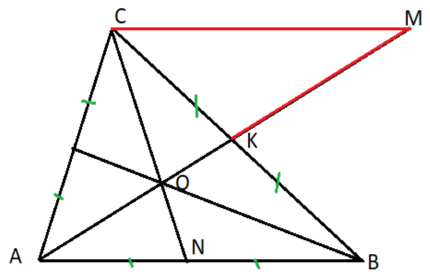
One of the most important requirements for improving the quality of education is to arouse interest and activity among students. This can be achieved by correctly and skillfully presenting the new material. As a result of the presentstion of given which the questions asked by the teacher can be sloved should be clear to the students. Their interest in the subject will increase only when the presentation of a new topic is carried out with the active participation of all students. While thinking about the next lesson, the teacher should have clearly in mind the purpose of this lesson, so that this lesson creates new concepts and ideas in the students and makes them gain some new knowledge. When planning lessons, it is necessary to pay special attention to each of its elements, such as asking questions, explaining a new topic, repeating. We present examples of problems that will help students expand their geometric imagination and enrich their thinking.

Issue 1

Prove that the medians of triangles are divided in the rato 2:1 at the point of intersection.

The purpose of proving these problems is that there are many problems that can be solved using the proof of this problem.

Proof:



According to the median poperty- CK=KB, AN=NB.

It is enough for us to prove- $\frac{CO}{ON} = 2$.

We make a cross section CM parallel to AB, where an additional figure CKM triangle is formed. Hence ΔAKB = ΔCKM

<KAB=<KMC; <ABK=<MCK (according to the property of internal alternating angles)

<AKB=<CKM –vertical angles. ΔAKB ~ ΔCKM from CK:KB=CM:AB=1, hence

It is derived -CM=AB .

There will also be ΔAON~ΔCOM . CO:ON=CM:AN=2 , because 2AN=AB=CM .We get the result CO=2ON . **It has been proven.**

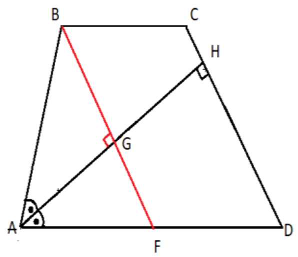
Issue 2

Find AB =?. Here BC=4, AD=11 and AH(height) is bisector for altitude <BAD.

(look at the picture2)

Solution: We pass BF parallel to CD as an auxiliary line.The section BF from the line CD∥BF is perpendicular to the section AH.

BCDFis parallelogram. BC=FD=4; $AD - FD = AF = 7$; ΔBAF is equilateral triangle, because



2-picture

AG(height) is bisector bajaradi. Thus, it follows that AF=AB=7 . **result: AB=7**

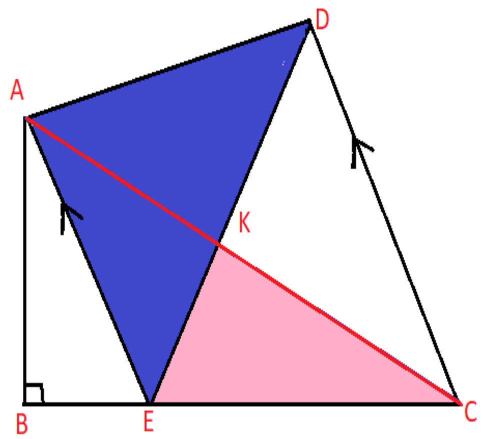
Issue 3

Find S(AED) according to the figure. AB=4; EC=6; AE∥DC; AB⊥BC;

Solution: ΔAEC is auxiliary figure; AECD-trapeziod. Hence

S(ECK)=S(ADK) ;

(surfaces of adjacent triangles are equel)



S(AEC)=S(AED), because, S(AEC)=S(AEK)+S(ECK); S(AED)=S(AEK)+S(AKD); i.e. S(ECK)=S(ADK)

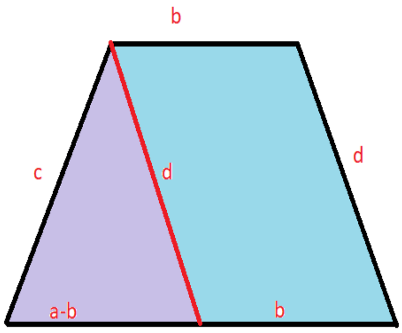
S(AEC)=S(AED)=$\frac{1}{2}$AB · EC =12

result: S(AED)=12.

Issue 4

The larges of the parallel sides of the trapezoid is a,the smallest is b, the non-parallel sides are c and d.

Find the face of the trapezoid.



Solution: The auxiliary figure is a triangle**.**

We calculate $S_\Delta = \sqrt{p(p-c)(p-b)(p-a+b)}$; p=$\frac{1}{2}(a-b+c+d)$;

We find the height S_Δ=$\frac{1}{2}(a-b)h$.

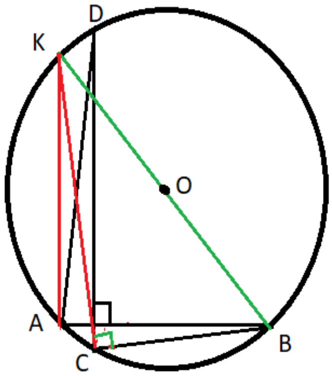
$$h = \frac{1}{2(a-b)}\sqrt{(c+d+a-b)(c+d+b-a)(a-b-c+d)(c+a-b-d)}$$

This height will also be the height of the trapezoid.

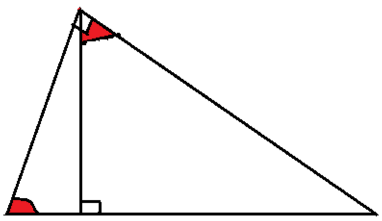
Result $S_T = \frac{a+b}{2}h = \frac{a+b}{4(a-b)}\sqrt{(c+d+a-b)(c+d+b-a)(a-b-c+d)(c+a-b-d)}$

Issue 5.

A circle whose radius is equel to R is crossed by mutually perpendicular lines AB and CD. Prove that $AD^2 + CB^2 = 4R^2$.



Proof: <CBA=<ADC=<AKC because an arc is drawn .



According to the right triangle property; <CBA=<KCD. It follows that CK and AD are equel. (CK is auxiliary figure)

ΔBCK It follows for ΔBCK that $CB^2 + CK^2 = KB^2 = 4R^2$. Thus, it follows $CB^2 + AD^2 = 4R^2$ by CK=AD.

It has been proved.

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