

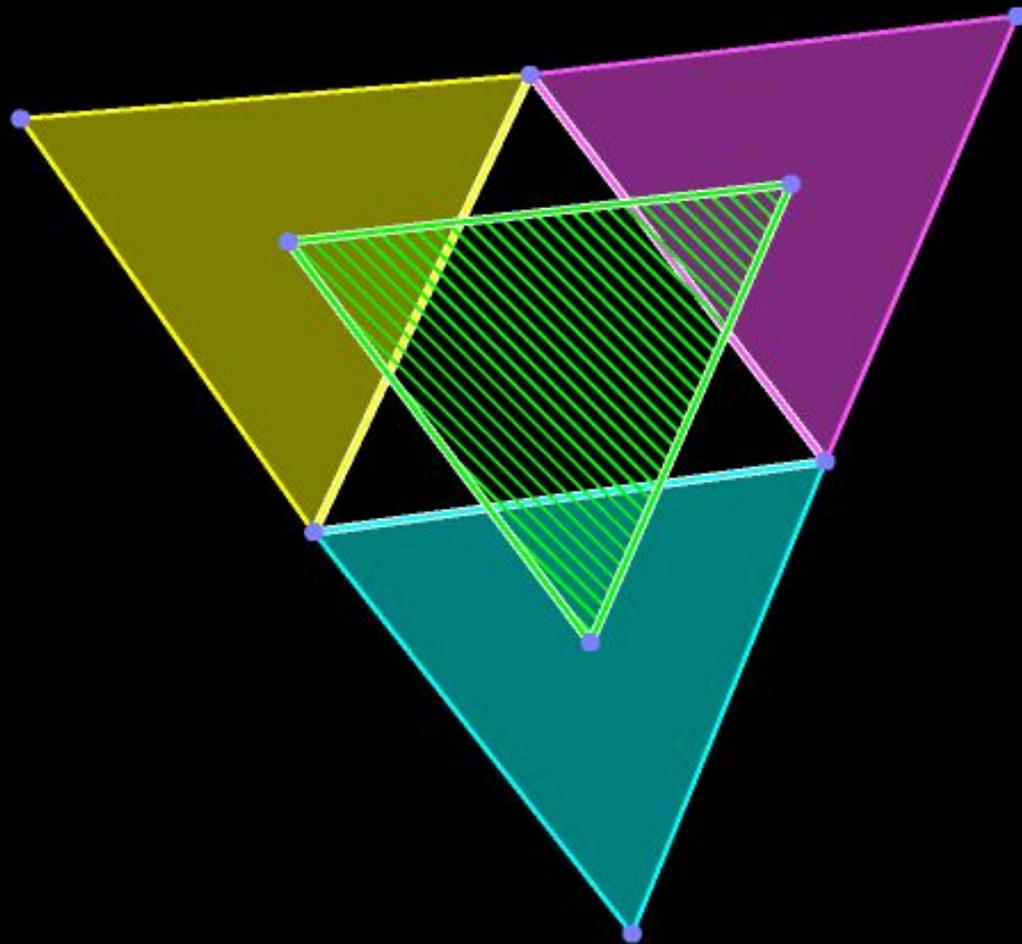
ГЕОМЕТРИЧЕСКИЕ УВЛЕЧЕНИЯ НАПОЛЕОНА

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Дигорский Дом детского творчества

НАПОЛЕОН БОНАПАРТ (1769-1821)





ТЕОРЕМА НАПОЛЕОНА

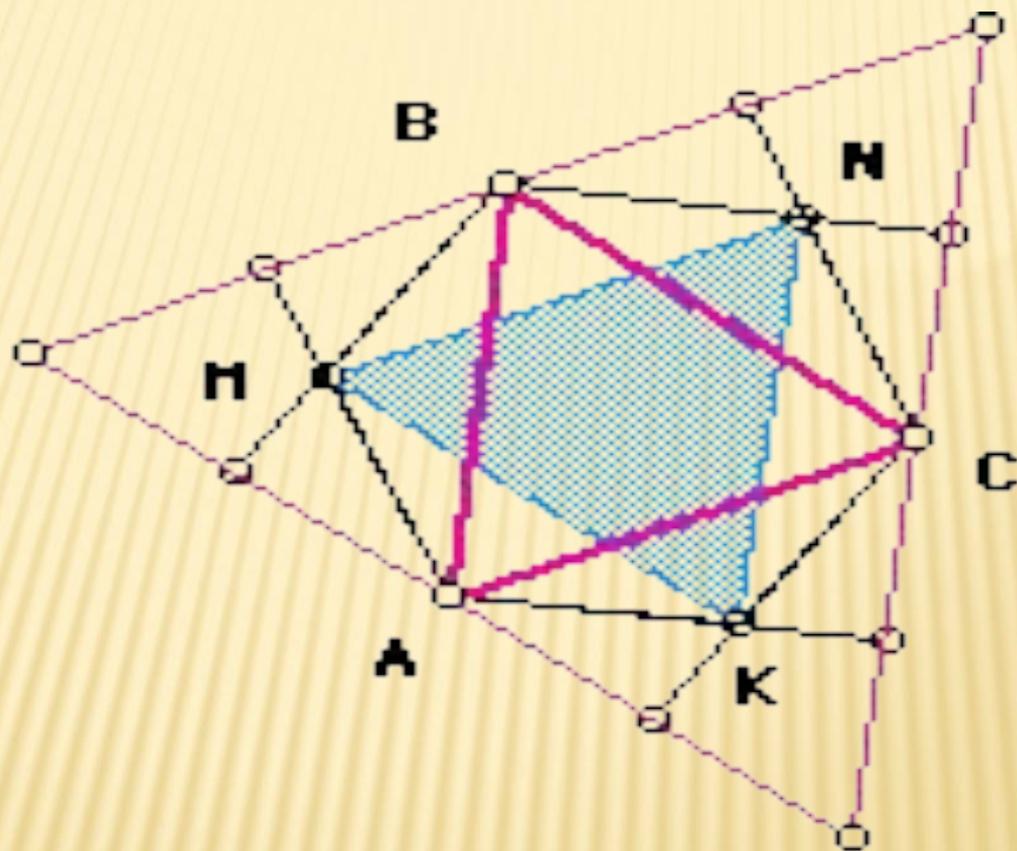


Рис. 1

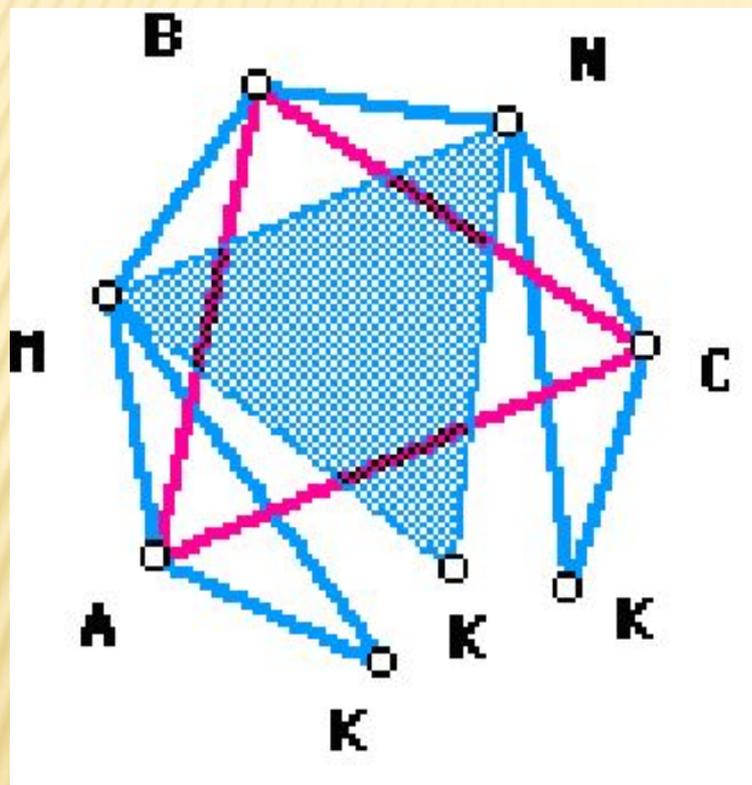


Рис. 2

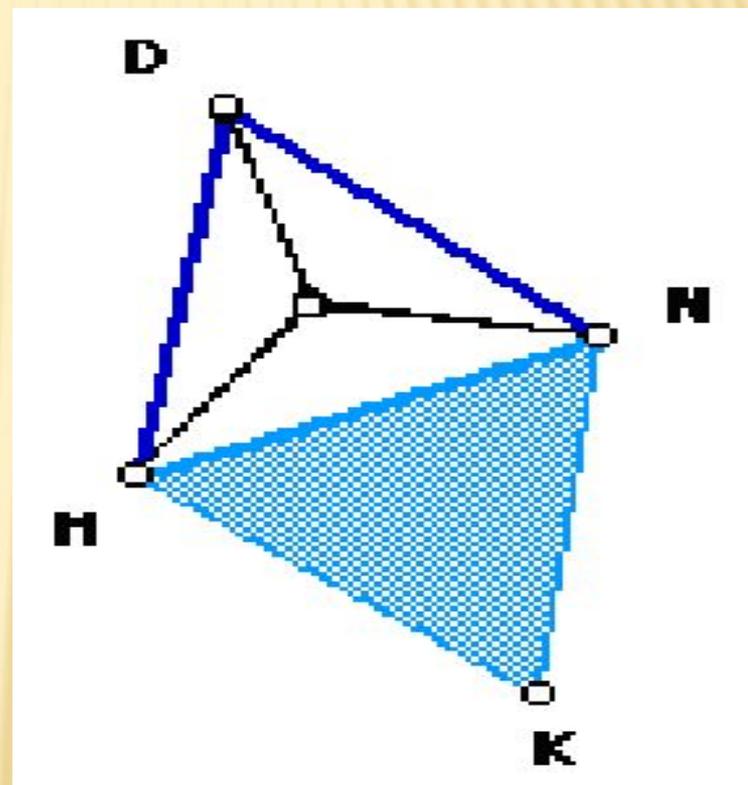


Рис. 3

ДОКАЗАТЕЛЬСТВО С ПОМОЩЬЮ ЛЕММЫ

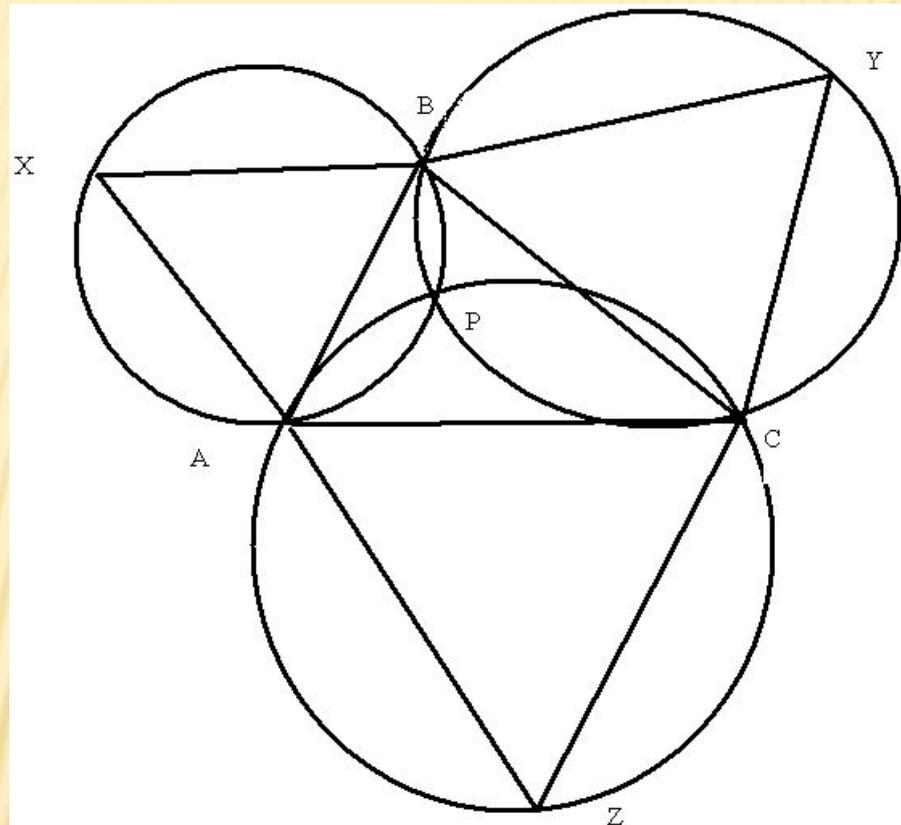


Рис. 4

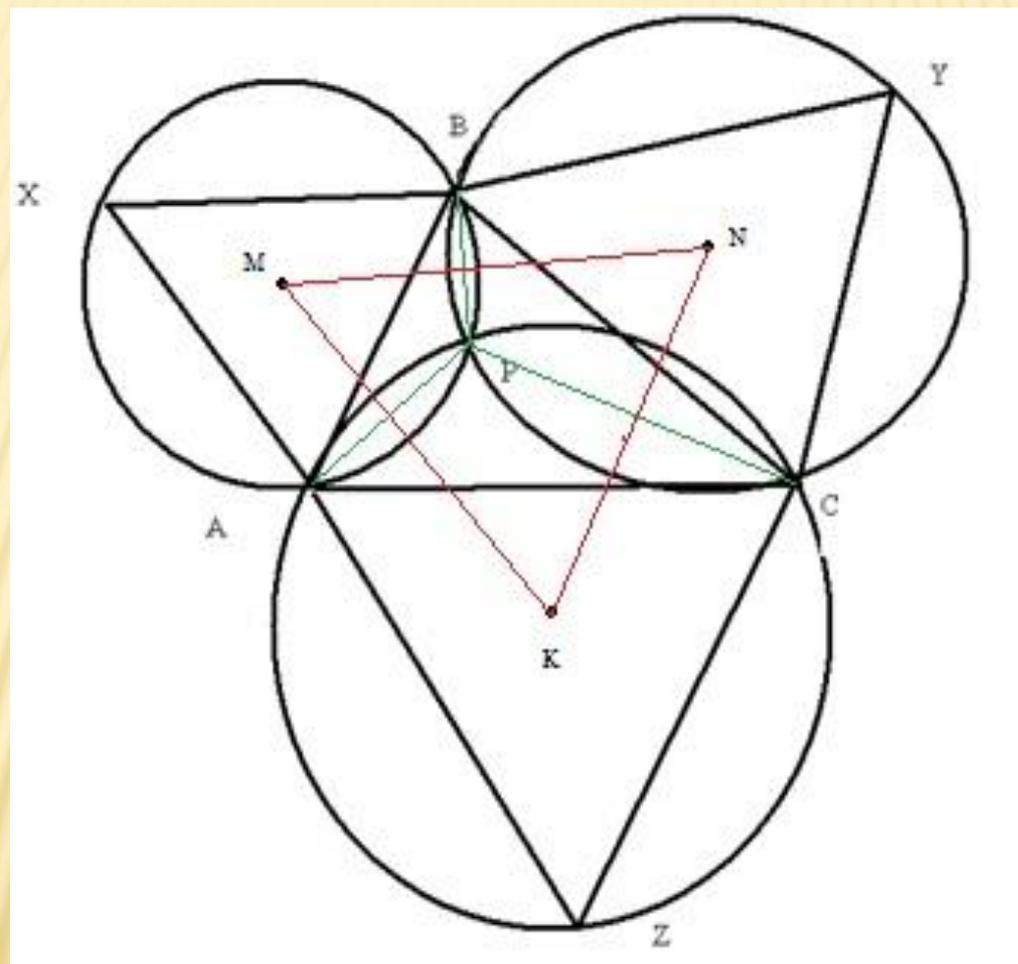


Рис. 5

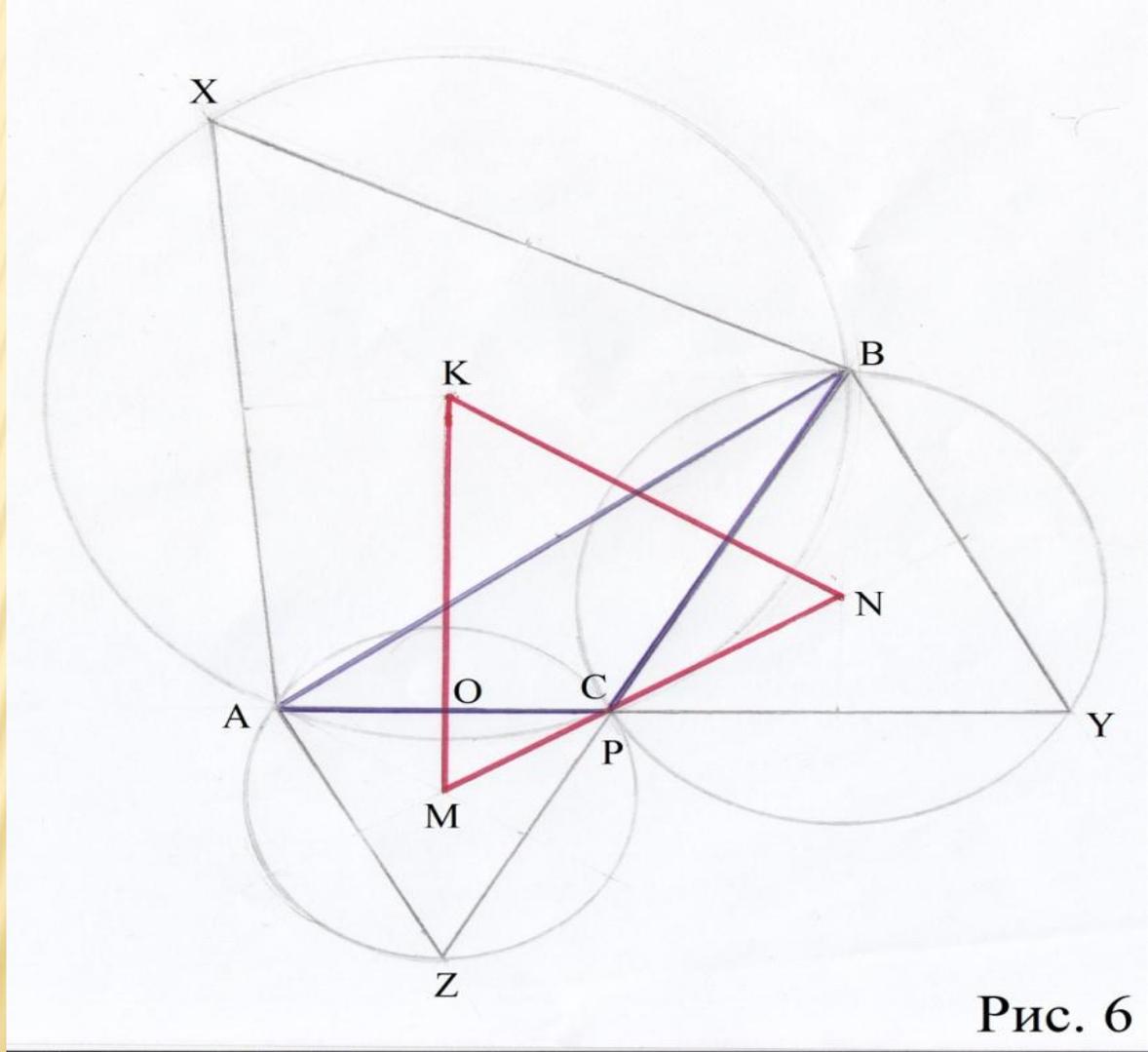


Рис. 6

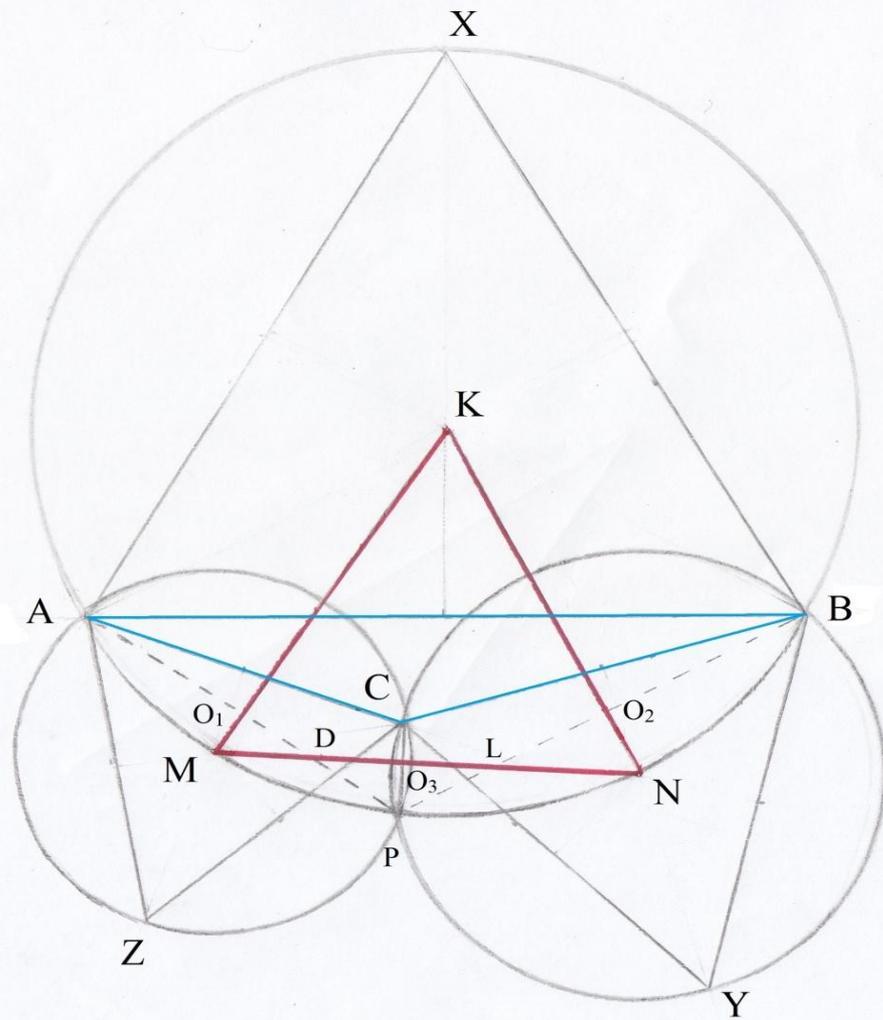


Рис. 7

ДОКАЗАТЕЛЬСТВО №3

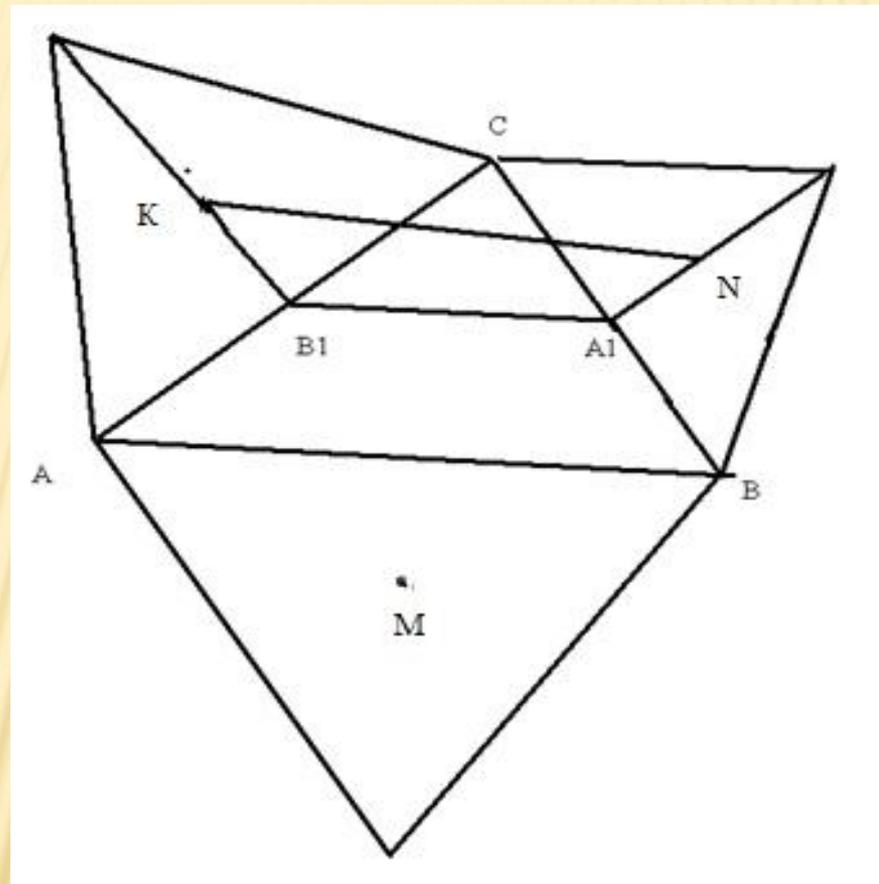


Рис. 6

$$KN^2 = \frac{1}{6}(a^2 + b^2 + c^2 + 4\sqrt{3}S).$$

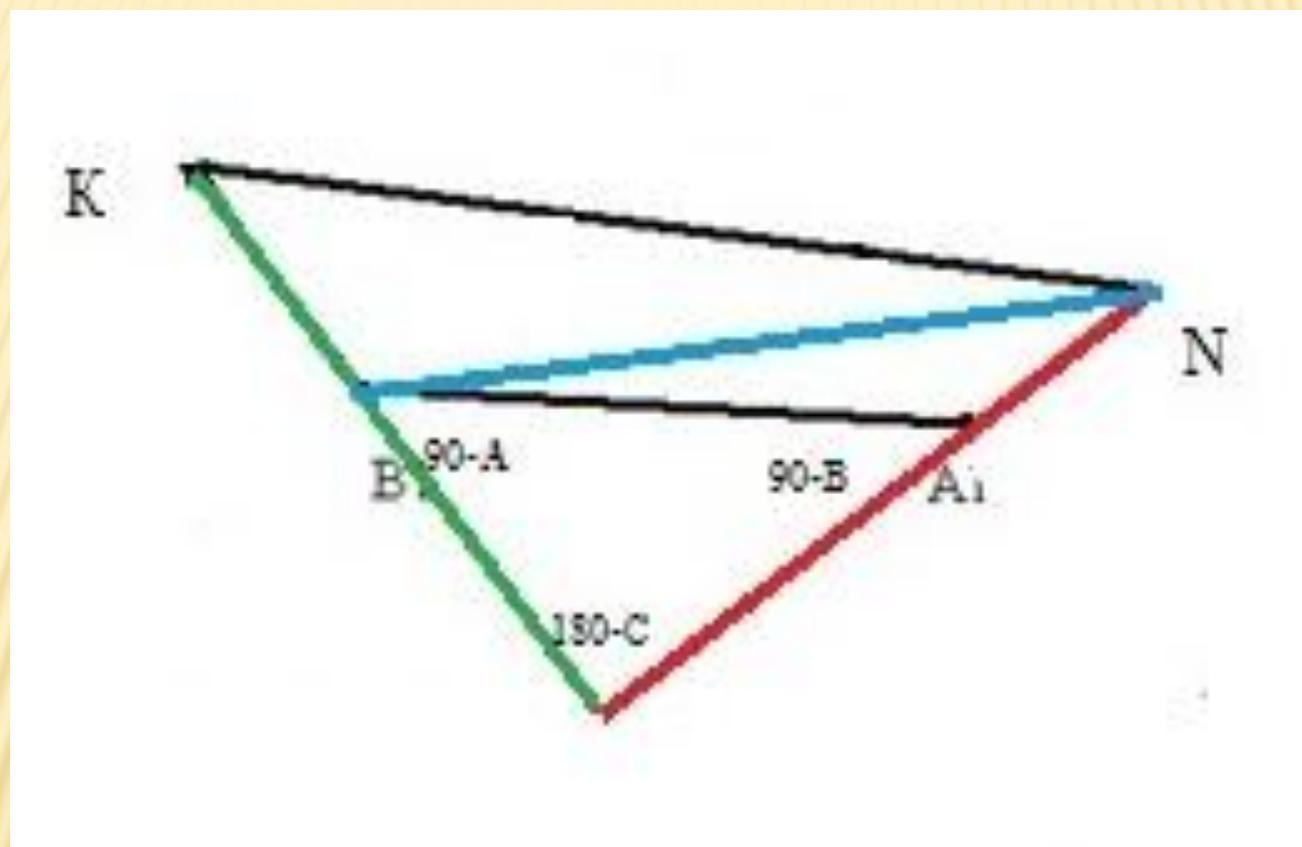


Рис. 7

$$\begin{aligned} \underline{KN^2} = & KB_1^2 + B_1A_1^2 + A_1N^2 + 2 KB_1 \cdot B_1A_1 \cdot \cos(90^\circ - A) + 2 KB_1 \cdot A_1N \cdot \cos C + 2 B_1A_1 \cdot \\ & A_1N \cdot \cos(90^\circ - B) = \left(\frac{b\sqrt{3}}{6}\right)^2 + \left(\frac{c}{2}\right)^2 + \left(\frac{a\sqrt{3}}{6}\right)^2 + 2 \cdot \frac{b\sqrt{3}}{6} \cdot \frac{c}{2} \cdot \sin A + 2 \cdot \frac{b\sqrt{3}}{6} \cdot \frac{a\sqrt{3}}{6} \cdot \cos C + 2 \cdot \frac{a\sqrt{3}}{6} \cdot \\ & \frac{c}{2} \cdot \sin B. \end{aligned}$$

$$\text{Поэтому } KN^2 = \frac{a^2 + b^2}{12} + \frac{c^2}{4} + \frac{ac\sqrt{3}}{6} \sin \angle B + \frac{bc\sqrt{3}}{6} \sin \angle A + \frac{2ab}{12} \cos \angle C.$$

$$\text{Но } ac \sin \angle B = bc \sin \angle A = 2S, 2ab \cos \angle C = a^2 + b^2 - c^2.$$

$$\text{Следовательно, } KN^2 = \frac{1}{6} (a^2 + b^2 + c^2 + 4\sqrt{3}S).$$

ЗВЕЗДА ДАВИДА



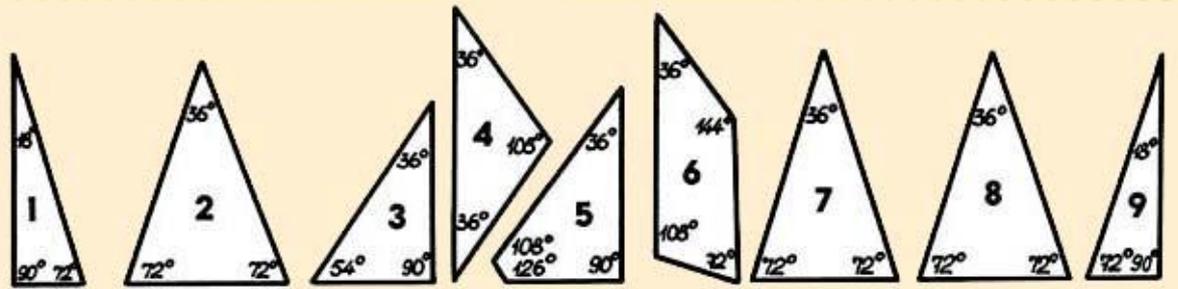


Рис. 8

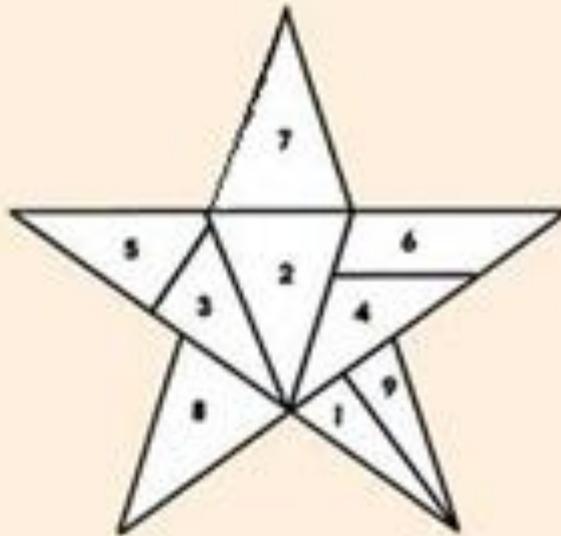
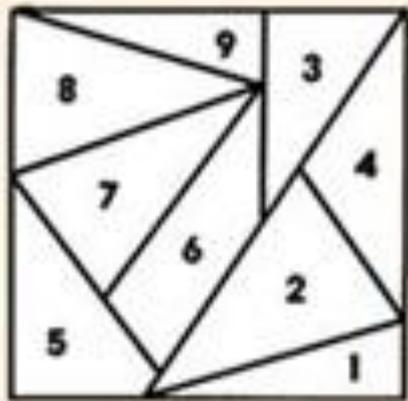
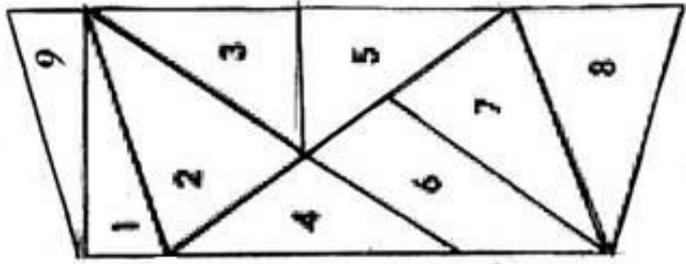
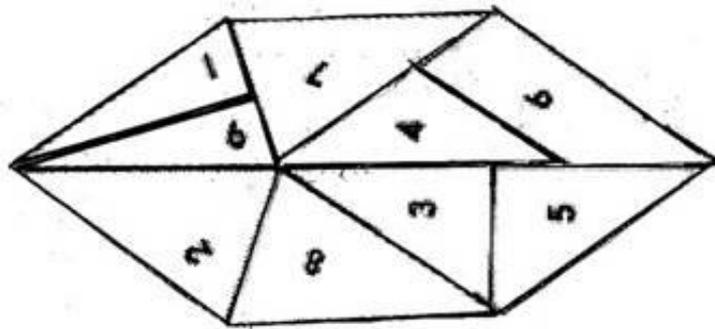
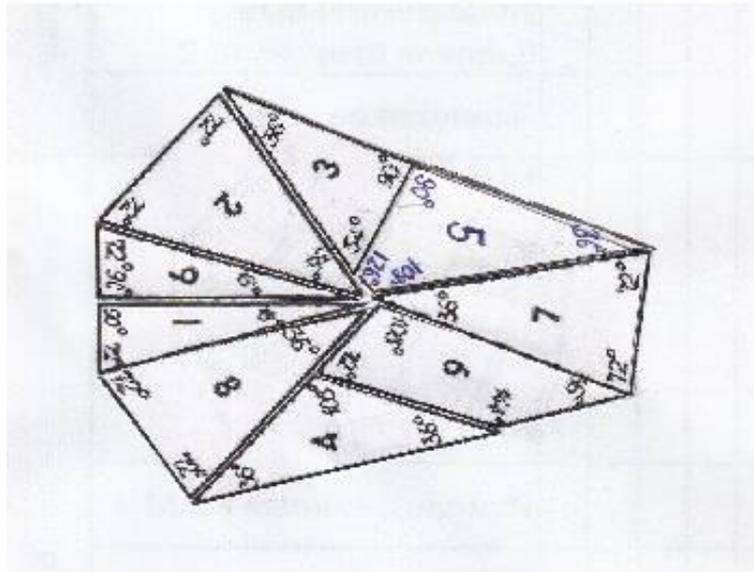
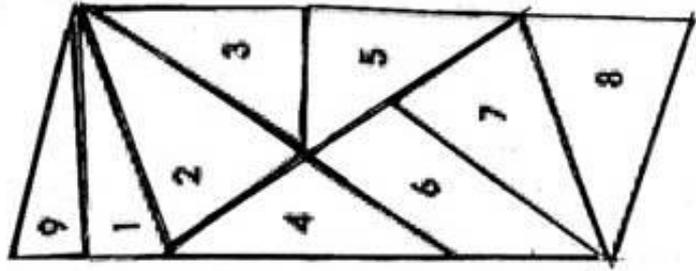


Рис. 9



СПАСИБО ЗА ВНИМАНИЕ!