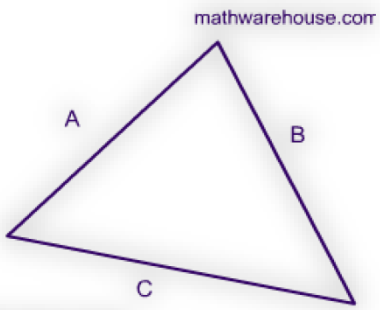
ХЕРОНОВА ФОРМУЛА ЗА ПЛОШТИНА НА ТРИАГОЛНИК.
ПЛОШТИНИ НА СЛИЧНИ ТРИАГОЛНИЦИ

Heron's Formula

$$S = \frac{A + B + C}{2}$$



$$\text{Area} = \sqrt{S(S - A)(S - B)(S - C)}$$

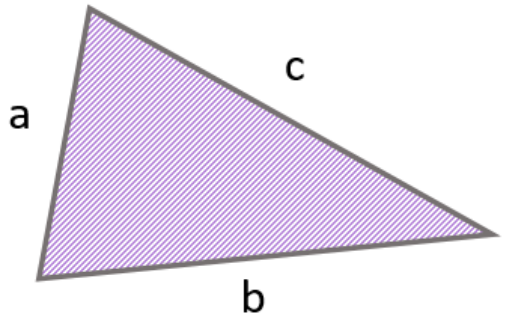
22. Пресметај ја плоштината на триаголникот, ако се зададени неговите страни:

а) 13*cm*, 14*cm*, 15*cm*, б) 13*cm*, 15*cm*, 4*cm*, в) 13*cm*, 21*cm*, 20*cm*.

а) $\boldsymbol{P = \sqrt{s(s-a)(s-b)(s-c)}}$

$$\boldsymbol{s = \frac{a+b+c}{2}} = \frac{13+14+15}{2} = \frac{42}{2} = 21cm$$

$$P = \sqrt{21(21-13)(21-14)(21-15)} = 84cm^2$$



б) $\boldsymbol{P = \sqrt{s(s-a)(s-b)(s-c)}}$

$$\boldsymbol{s = \frac{a+b+c}{2}} = \frac{13+15+4}{2} = \frac{32}{2} = 16cm$$

$$P = \sqrt{16(16-13)(16-15)(16-4)} = 24cm^2$$

Perimeter = a + b + c

$$s = \frac{\text{Perimeter}}{2}$$

Heron's Formula:

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

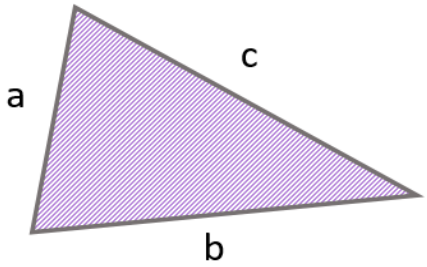
в) $\boldsymbol{P = \sqrt{s(s-a)(s-b)(s-c)}}$

$$\boldsymbol{s = \frac{a+b+c}{2}} = \frac{13+21+20}{2} = \frac{54}{2} = 27cm$$

$$P = \sqrt{27(27-13)(27-21)(27-20)} = 126cm^2$$

23. Дадени се страните во триаголникот 50*cm*, 58*cm* и 72*cm*.

Одреди ја најмалата висина во триаголникот.



$$\boldsymbol{s} = \frac{\boldsymbol{a}+\boldsymbol{b}+\boldsymbol{c}}{\boldsymbol{2}} = \frac{50+58+72}{2} = \frac{180}{2} = 90cm$$

$$\boldsymbol{P} = \sqrt{\boldsymbol{s}(\boldsymbol{s}-\boldsymbol{a})(\boldsymbol{s}-\boldsymbol{b})(\boldsymbol{s}-\boldsymbol{c})}$$

$$P = \sqrt{90(90-50)(90-58)(90-72)} =$$

$$= \sqrt{90*40*32*18} = 1440cm^2$$

Perimeter = a + b + c

$$s = \frac{\text{Perimeter}}{2}$$

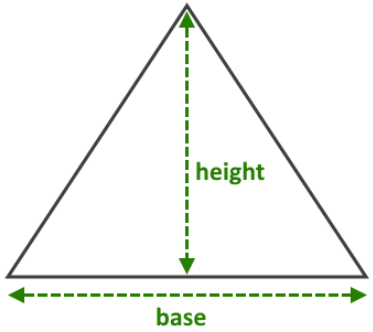
Heron's Formula:

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\boldsymbol{ha} = \frac{\boldsymbol{2P}}{\boldsymbol{a}} = \frac{2*1440}{50} = \frac{2880}{50} = 57.6cm$$

$$\boldsymbol{hb} = \frac{\boldsymbol{2P}}{\boldsymbol{b}} = \frac{2*1440}{58} = \frac{2880}{58} = 49.6cm$$

$$\boldsymbol{hc} = \frac{\boldsymbol{2P}}{\boldsymbol{c}} = \frac{2*1440}{72} = \frac{2880}{72} = 40cm$$



Area = (Base * Height)/2

Резултат:

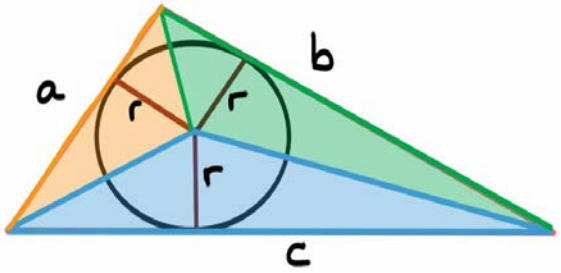
Најмалата висина во триаголникот е ***hc (висината на страната c).***

24. Пресметај ги радиусите на впишаната и опишаната кружница на триаголникот со страни 10*cm*, 17*cm*, 21*cm*.

$$\boldsymbol{P = \sqrt{s(s-a)(s-b)(s-c)}}$$

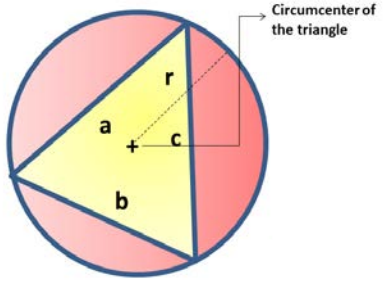
$$\boldsymbol{s = \frac{a+b+c}{2}} = \frac{10+17+21}{2} = \frac{48}{2} = 24cm$$

$$P = \sqrt{24(24-10)(24-17)(24-21)} = 84cm^2$$



$$\boldsymbol{P = sr}$$

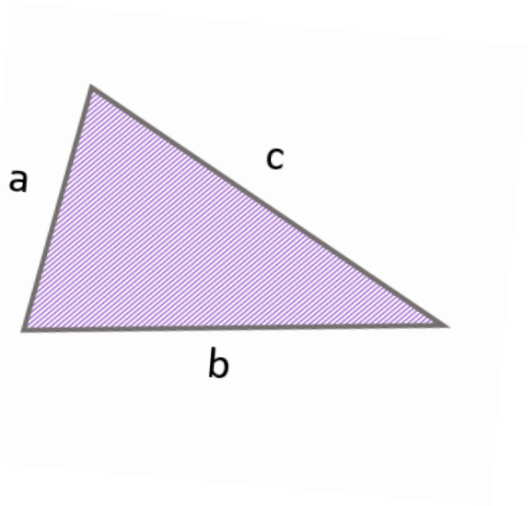
$$\boldsymbol{r = \frac{P}{s}} = \frac{84}{24} = 3{,}5\ cm$$



$$\boldsymbol{P = \frac{abc}{4R}}$$

$$\boldsymbol{R = \frac{abc}{4P}} = \frac{10*17*21}{4*84} = 10{,}625\ cm$$

25. Најди ги страните на триаголникот, ако тие се однесуваат како 9:10:17, а неговата плоштина е 144cm^2.



a=? b=? c=?

9x=a 10x=b 17x=c

$s = \frac{a+b+c}{2}$

*2*s=9x+10x+17x*

s=18x

P=144cm²

$144 = \sqrt{18x(18x-9x)(18x-10x)(18x-17x)}$ =

$= \sqrt{18x * 9x * 8x * 1x}$ =$\sqrt{1296x^4}$

144=36x²

$x^2 = \frac{144}{36} = 4$

$x = \sqrt{4} = 2$

9x=a 10x=b 17x=c

x =2

a = 9x = 9*2 = 18cm

b = 10x = 10*2 = 20cm

c = 17x = 17*2 = 34cm