

Теорема о сеч. и кас.

$$\begin{aligned} x^2 &= a^2 - r^2 \\ y^2 &= b^2 - r^2 \\ z^2 &= c^2 - r^2 \end{aligned}$$

$$\begin{aligned} AM &= x & AO &= a \\ BM &= BN = y & BO &= b \\ CN &= z & CO &= c \end{aligned} \quad \left. \begin{array}{l} a=3 \\ b=6 \\ c=4 \end{array} \right\}$$

Искать r

Теорема о бисект. р.

$$\frac{x+y}{a} = \frac{y+z}{c}; \quad (x-y)(x+y) = a^2 - b^2 = A$$

$$(y-z)(y+z) = b^2 - c^2 = B$$

$$x+y = u; \quad y+z = v; \quad x-y = p; \quad y-z = q$$

$$u - p = v + q$$

$$\begin{aligned} p \cdot u &= A & \frac{u}{a} &= \frac{v}{b}; & u - p &= v + q \\ q \cdot v &= B \end{aligned}$$

$$p = \frac{A}{u}; \quad q = \frac{B}{v}$$

$$k = \frac{a}{b}$$

$$u - \frac{A}{u} = v + \frac{B}{v}; \quad u = \frac{a}{b} \cdot v = kv$$

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$$kv - \frac{A}{kv} = v + \frac{B}{v}$$

$$A = a^2 - b^2 = 9 - 36 = -27$$

$$k = \frac{3}{6} = \frac{1}{2}$$

$$B = b^2 - c^2 = 36 - 16 = 20$$

$$\frac{v}{2} + \frac{27 \cdot 2}{v} = v + \frac{20}{v}$$

$$54 - 20 = 34$$

$$\frac{v}{2} = \frac{27 \cdot 2}{v} - \frac{20}{v} = \frac{34}{v}$$

$$34 = 2 \cdot 17$$

$$v = \sqrt{2 \cdot 34} = 2\sqrt{17}$$

$$v = y+z = BC = 2\sqrt{17}$$