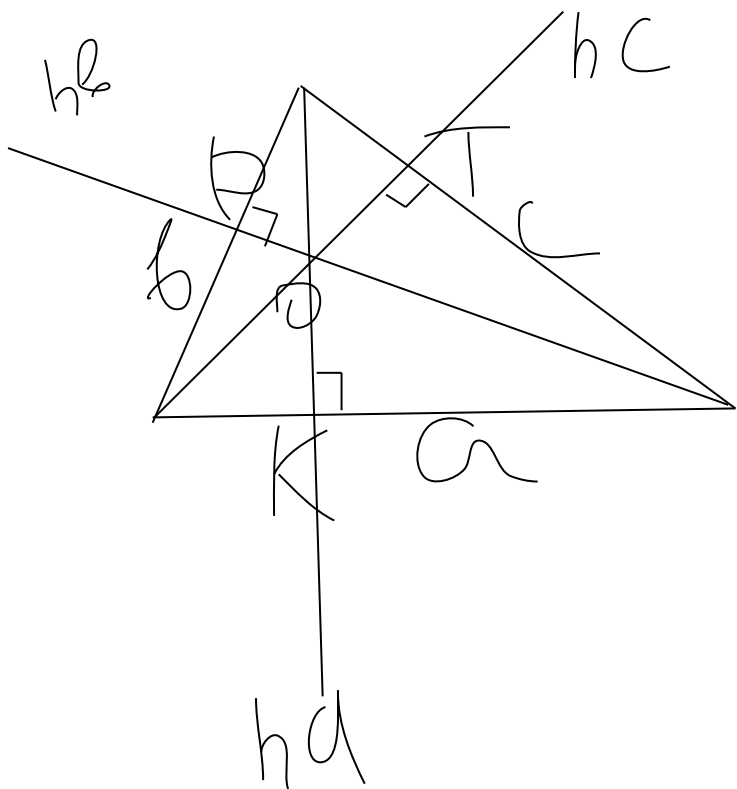


Дан произвольный тр со сторонами a, b, c (но сами стороны неизвестны). Известны его высоты h_a, h_b, h_c Найти r вписанной окружности



$$S = r(a+b+c)/2$$

$$S = h_a \cdot a / 2 = h_b \cdot b / 2 = h_c \cdot c / 2$$

$$S = (OT \cdot c + OK \cdot a + OP \cdot b) / 2$$

$$(OT \cdot c + OK \cdot a + OP \cdot b) / 2 = r(a+b+c) / 2$$

$$OT \cdot c + OK \cdot a + OP \cdot b - ra - rb - rc = 0$$

$$(OT \cdot c - rc) + (OK \cdot a - ra) + (OP \cdot b - rb) = 0$$

$$c(OT - r) + a(OK - r) + b(OP - r) = 0$$

$$c(OT - r) + a(OK - r) + b(OP - r) = 0$$

подсказка

$$S = h_a \cdot a / 2 = h_b \cdot b / 2 = h_c \cdot c / 2$$

$$a = 2S / (h_a)$$

$$b = 2S / (h_b)$$

$$c = 2S / (h_c)$$

$$S = r(a+b+c) / 2 = r(2S / (h_a) + 2S / (h_b) + 2S / (h_c)) / 2 =$$

$$= Sr(1 / (h_a) + 1 / (h_b) + 1 / (h_c)) = Sr(1 / (h_a) + 1 / (h_b) + 1 / (h_c))$$

$$S = Sr(1 / (h_a) + 1 / (h_b) + 1 / (h_c))$$

$$1 = r(1 / (h_a) + 1 / (h_b) + 1 / (h_c))$$

$$r = 1 / (1 / (h_a) + 1 / (h_b) + 1 / (h_c))$$

$$1/r = 1/(h_a) + 1/(h_b) + 1/(h_c)$$