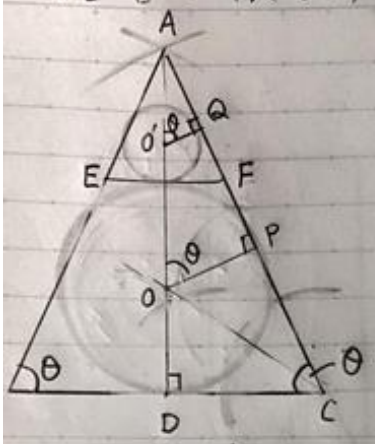
落書き帳「614」について

御代田知枝子

6 18(火)

落書き帳 614　　二等辺三角形の中の二円(その5)



頭円の半径 r
胴円の 〃 R
$BC = 1$, $DC = \frac{1}{2}$ とする

2組の角がそれぞれ等しいので
$\triangle ACD \backsim \triangle AOP \backsim \triangle AO'Q$

$\triangle AOP$において　$\cos\theta = \frac{PO}{AO} = \frac{R}{AD-R}$

$$R = (AD-R)\cos\theta$$

$$= AD\cos\theta - R\cos\theta$$

$$AD\cos\theta = (1+\cos\theta)R \quad ①$$

$\triangle AO'P$において　$\cos\theta = \frac{QO}{AO'} = \frac{r}{AD-2R-r}$

$$r = (AD-2R-r)\cos\theta$$

$$AD\cos\theta = (1+\cos\theta)r + 2R\cos\theta \quad ②$$

①=②より　$(1+\cos\theta)R = (1+\cos\theta)r + 2R\cos\theta$

$$(1+\cos\theta-2\cos\theta)R = (1+\cos\theta)r$$

$$(1-\cos\theta)R = (1+\cos\theta)r$$

$$R = \frac{1+\cos\theta}{1-\cos\theta}r$$

$$r : R = 1 : \frac{1+\cos\theta}{1-\cos\theta} = 1-\cos\theta : 1+\cos\theta$$