```
09-11-2024 STEP Practice: Problem 13 (2003.3.6)
                                                                                                                                                 pinA + pinB = 2 pin \left(\frac{A+B}{2}\right) cop \left(\frac{A-B}{2}\right)
                        2\sin(\frac{1}{2}\theta)\cos(r\theta) = \sin[(r+\frac{1}{2})\theta] - \sin[(r-\frac{1}{2})\theta]
                                                                                                                                               A = A - A = B = 2 \cos \left(\frac{A+B}{2}\right) \sin \left(\frac{A-B}{2}\right)

\begin{array}{l}
\text{RHS} = fin\left[(r+\frac{1}{2})\theta\right] - fin\left[(r-\frac{1}{2})\theta\right] \\
= 2\cos\left[\frac{(r+\frac{1}{2})\theta + (r-\frac{1}{2})\theta}{2}\right] fin\left[\frac{(r+\frac{1}{2})\theta - (r-\frac{1}{2})\theta}{2}\right] \\
= 2\cos\left[\frac{(r+\frac{1}{2})\theta + (r-\frac{1}{2})\theta}{2}\right] fin\left[\frac{(r+\frac{1}{2})\theta - (r-\frac{1}{2})\theta}{2}\right]
\end{array}

                                                                                                                                            COfA + CofB = 2 COf \left[\frac{A+B}{2}\right] Cof \left[\frac{A-B}{2}\right]
COfA - CofB = -2 fin \left[\frac{A+B}{2}\right] fin \left[\frac{A-B}{2}\right]
                              = 2cop(r\theta)pin(\frac{\theta}{2}) = LHS
                          Y = \alpha : 2(0)(\alpha\theta)\sin(\frac{\theta}{2}) = \sin(\alpha+\frac{1}{2})\theta - \sin(\alpha-\frac{1}{2})\theta
                                                                                                                                                              Method of differences
                         r = a+1° 2 cos \left[ (a+1) \theta \right] sin \left( \frac{b}{2} \right) = sin \left[ (a+\frac{1}{2}) \theta \right] - sin \left[ (a+\frac{1}{2}) \theta \right]
                                                                                                                                                              for telescoping series
                        r=a+2° 2 cos [(a+2)0] gin (2) = sin [(a+2)0] - sin [(a+2)0]
                        r=b-3° 2001 [(b-3) 0] pin (2) = 1in [(b-2) 0] - pin [(b-2) 0]
                        Y=b-2. 2\cos[(b-2)\theta]\sin(\frac{\theta}{2})=\min[(b-\frac{1}{2})\theta]-\sin[(b-\frac{1}{2})\theta]
                        r=b-1.2201[(b-1)0] pin (2) = pin [(b-1)0] - sin [(b-2)0]
                         \longrightarrow jin(\frac{\theta}{2})[log(a\theta) + cog((a+1)\theta) + ... + cog((b-1)\theta)] = jin[(b-\frac{1}{2})\theta] - jin[(a-\frac{1}{2})\theta]
                             \min[(b-\frac{1}{2})\theta] - \min[(u-\frac{1}{2})\theta] = 0
                        \frac{2\cos\left((b-\frac{1}{2})\theta+(\alpha-\frac{1}{2})\theta\right)}{2}\sin\left((b-\frac{1}{2})\theta-(\alpha-\frac{1}{2})\theta\right)=0
                        \frac{2\cos\left(a+b-1\right)\theta}{2}\sin\left(b-a\right)\theta}{2}=0
                          2in\left[\frac{(b-a)\theta}{2}\right] = 0 \implies \frac{(b-a)\theta}{2} = \pi R, R \in \mathbb{Z}
\Rightarrow \theta = \frac{2\pi R}{b-a}
```