GoGeometry Problem 350

This solution was submitted by Michael Tsourakakis from Greece

QS=HP (common tangents of circles 2,3). We know of 349 problem that

EG = FH = DP = DN = RM = QR

QS=HP⇒QR+RS=HF+FP⇒RS=FP But RS=RN (common tangents of circle 3) so FP=RN

CT=CF(tangent lots circle 1) , CP=CK (tangent lots circle 3) therefore CF-CP=CT-CK⇒

⇒FP=TK . Because FP=RN . finally RN=TK .But BN=BK (tangent lots circle 3)

So BN-RN=BK-TK⇒BR=BT ⇒Triangle BRT is isosceles ,so bisector BI the angle DBC is mediator of RT .So ∠LRT=∠LTR=∠x, ∠ BRL=∠ω and ∠ ELR=∠2x

because the quadrilateral EBLR ,∠BEL=∠BRL=∠ω is inscribable .So

∠ABD=v=∠ELR=∠2x= 2∠ETR

ο.ε.δ

FIGURE