SOLUTION TO PROBLEM NO. 22

The two radii and connecting tangent are unchanged in length and will be on a radius of: \( R^2 = (AC+DE)^2 + 43.21^2 \), with A as the center point. \( R = 210.679 \).

Draw arc \( R = AE \) through E. Construct JK = FE parallel with GE, K being the intersection with the arc.

Construct EL and KM perpendicular to JK with ALM on a line parallel with JK.

Extend ED to H, AH being parallel with CD.

\[
43.21' \\
\text{Angle } AEH = \arctan \frac{43.21}{210.679} = 11^\circ 50'07'' \\
210.679' \\
\]

\[
\text{Angle } FEA = \text{angle } EAM = 58^\circ 11' + 11^\circ 50'07'' = 70^\circ 01'07'' \\
\]

\[
AL = 210.679 \sin 19^\circ 58'53'' = 71.992', \ LM = 34', \ \text{so } AM = 105.992' \\
105.992' \\
\text{Angle } AKM = \arcsin \frac{105.992}{210.679} = 30^\circ 12'18'' \\
210.679' \\
\]

\[
EL = 210.679 \cos 19^\circ 58'53'' = 197.997' \\
\]

\[
KM = 210.679 \cos 30^\circ 12'18'' = 182.075', \ \text{so } JG = 197.997' - 182.075' = 15.922' \\
\]

Construct right triangle KQA, with QA = 43.21’. Construct AP parallel with QK.

\[
\text{Angle } AKQ = \text{angle } KAP = 11^\circ 50'07'' \\
\]

\[
\text{Angle } MKQ = 42^\circ 02'25'', \ \text{so angle } JKQ = \text{angle } PAM = 47^\circ 57'35'' \\
\]

\[
\text{Angle } BAM = 21^\circ 19', \ \text{so angle } PAB = 47^\circ 57'35'' - 21^\circ 19' = 26^\circ 38'35'' \\
\]

(This can be solved with coordinate geometry by intersecting a line parallel with and distant 81.2’ from JG with the distance AE, and then intersecting the distance 43.21’ with the distance 125’+81.2’, just the way it was constructed).