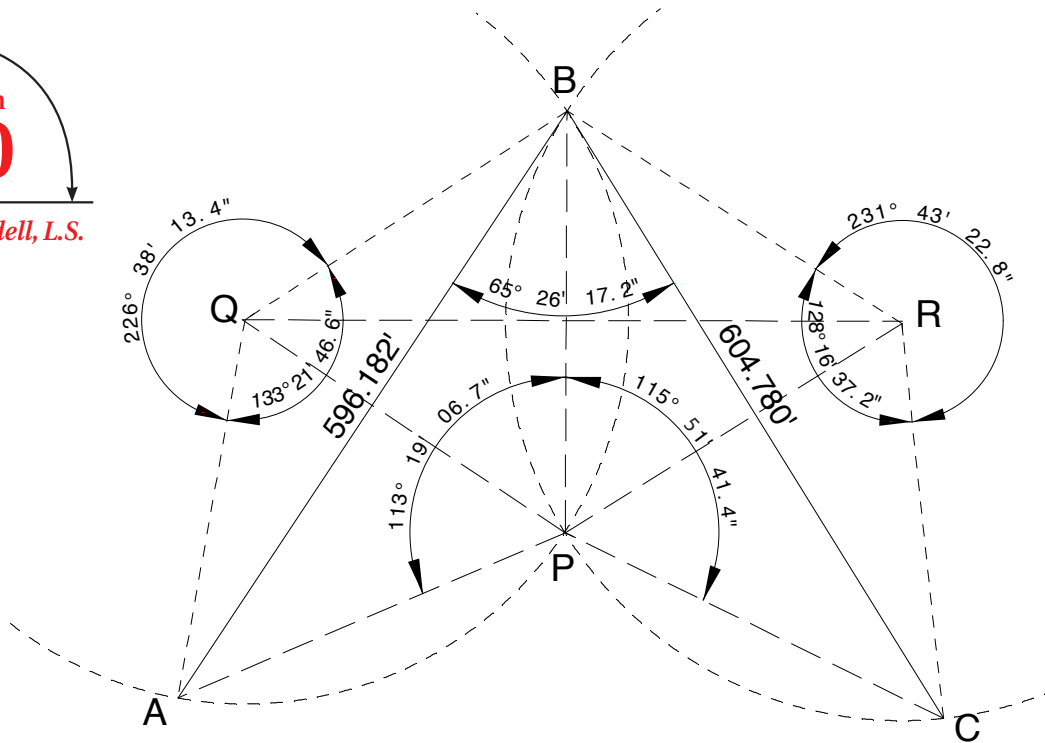


**Solution
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by Dave Lindell, L.S.



Angle AQB (the one greater than 180°) = $2(113^{\circ}19'06.7'') = 226^{\circ}38'13.4''$
 making angle AQB (the one less than 180°) = $133^{\circ}21'46.6''$
 Therefore, angle QAB = QBA = $\frac{1}{2}(180^{\circ} - 133^{\circ}21'46.6'') = 23^{\circ}19'06.7''$
 $AB = 596.182 = AQ\cos 23^{\circ}19'06.7'' + BQ\cos 23^{\circ}19'06.7''$, but $AQ = AB$,
 so, $2AQ\cos 23^{\circ}19'06.7'' = 596.182$ and $AQ = QB = 324.6053$

Also, angle BRC (the one greater than 180°) = $2(115^{\circ}51'41.4'') = 231^{\circ}43'22.8''$ and
 angle BRC (the one less than 180°) = $128^{\circ}16'37.2''$
 angle RBC = angle RCB = $\frac{1}{2}(180^{\circ} - 128^{\circ}16'37.2'') = 25^{\circ}51'41.4''$
 $CB = 604.780 = CR\cos 25^{\circ}51'41.4'' + BR\cos 25^{\circ}51'41.4''$, but $CR = BR$
 so, $2CR\cos 25^{\circ}51'41.4'' = 604.780$ and $CR = BR = 336.0445$

$QR^2 = QB^2 + BR^2 - 2QB\cos(23^{\circ}19'06.7'' + 65^{\circ}26'17.2'' + 25^{\circ}51'41.4'')$
 $= 324.6053^2 + 336.0445^2 - (2)(324.6053)(336.0445)\cos 114^{\circ}37'05.3''$
 $QR = 556.0347$

$$\frac{\sin BRQ}{324.6053} = \frac{\sin BQR}{336.0445} = \frac{\sin 114^{\circ}37'05.3''}{556.0347}$$

angle BRQ = $32^{\circ}03'15.4''$, angle BQR = $33^{\circ}19'39.3''$

(Note: $114^{\circ}37'05.3'' + 32^{\circ}03'15.4'' + 33^{\circ}19'39.3'' = 180^{\circ}00'00.0''$)

$BP = 2(324.6053)(\sin 33^{\circ}19'39.3'') = 356.6926$
 [as a check, $BP = 2(336.0445)(\sin 32^{\circ}03'15.4'') = 356.6927$]

Because QR is perpendicular to BP, angle BRQ=angle QRP and angle BQR=angle PQR
 angle BPR = $90^{\circ} - 32^{\circ}03'15.4'' = 57^{\circ}56'44.6''$
 angle BPQ = $90^{\circ} - 33^{\circ}19'39.3'' = 56^{\circ}40'20.7''$

angle QPA = angle QAP = $113^{\circ}19'06.7'' - 56^{\circ}40'20.7'' = 56^{\circ}38'46.0''$
 angle RPC = angle PRC = $115^{\circ}51'41.4'' - 57^{\circ}56'44.6'' = 57^{\circ}54'56.8''$

$AP = (2)(324.6053)[\sin \frac{1}{2}[180^{\circ} - (2)(56^{\circ}38'46.0'')]] = 356.9416$

$PC = (2)(336.0445)[\sin \frac{1}{2}[180^{\circ} - (2)(57^{\circ}54'56.8'')]] = 356.9903$