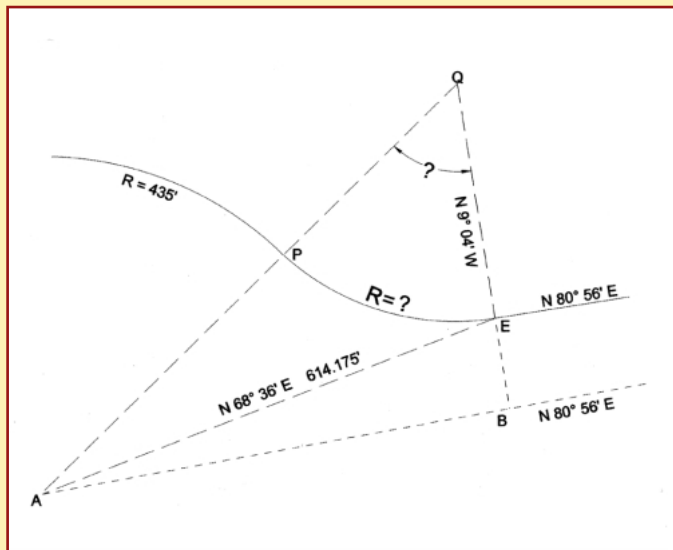




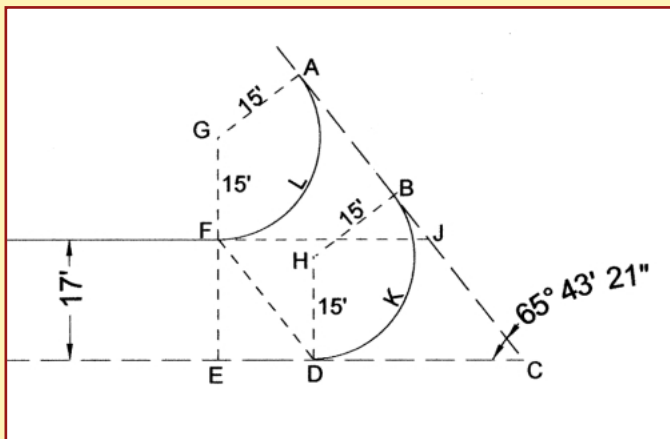
Solution to Problem Number 17

Construct line AB perpendicular to the extension of line QE (and therefore parallel with the tangent line).

$AB = 614.175' \cos(80^{\circ}56' - 68^{\circ}36') = 600.000'$
 $EB = 614.175' \sin(80^{\circ}56' - 68^{\circ}36') = 131.187'$
 $AQ = AP + PQ$, but $AP = 435'$, and $PQ = R$ so that $(435 + R)^2 = 600^2 + (R + 131.187)^2$
 Expanding and solving for R yields $R = 309.376'$
 The tangent of the central angle is AB divided by QB, which is 600.00 divided by 440.563 or 1.361893759. The central angle is therefore $53^{\circ}42'40''$.



Solution to Problem Number 18



Shaded area = EDKBALF
 = Area GACE - Sector GALF - Area DKBC,
 but Area DKBC = Area FLAJ (same central angle and radius)
 Sector GALF + Area FLAJ = Area FGAJ
 and the shaded area =
 Area GACE - Area FGAJ = Area FJCE, a trapezoid.

$$FJ = DC = 15 \tan \frac{(180^{\circ} - 65^{\circ}43'21'')}{2} = 23.221'$$

$$ED = 17 \tan(90^{\circ} - 65^{\circ}43'21'') = 7.668',$$

so $EC = 30.889'$

$$\text{Area} = \frac{23.221 + 30.889}{2} \times 17 = 459.93 \text{ square feet}$$