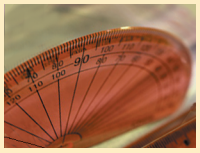
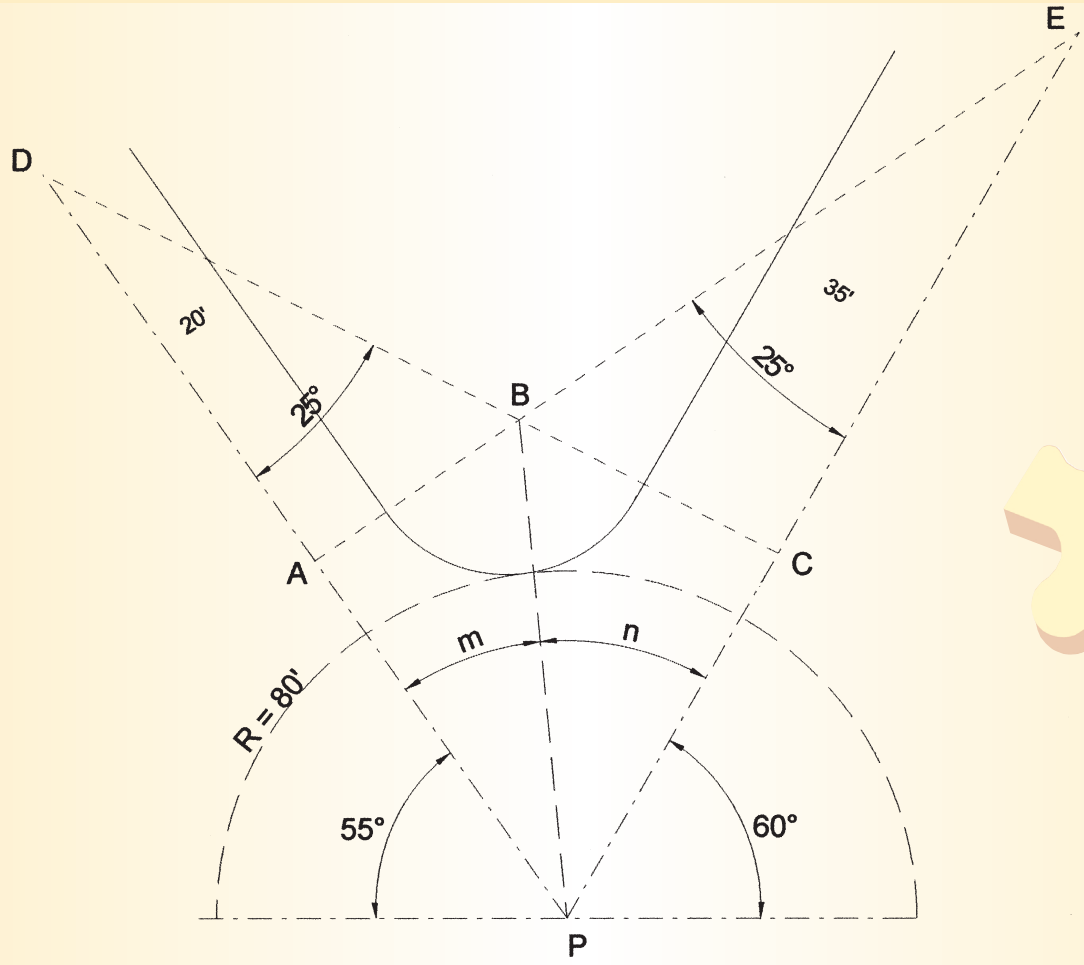


Solution to Problem 34



$$\sin m = \frac{R + 20}{R + 80}, \qquad \sin n = \frac{R + 35}{R + 80}, \qquad m + n = 65°$$

$$\sin (m+n) = \sin m \cos n + \sin n \cos m = \sin 65°$$

$$\cos m = \frac{AP}{R + 80}, \qquad \cos n = \frac{CP}{R + 80}$$

$$\frac{(R+20)}{(R+80)}\frac{CP}{(R+80)} + \frac{(R+35)}{(R+80)}\frac{AP}{(R+80)} = \sin 65° \qquad \text{(Equation \#3)}$$

$$\frac{AP}{\sin 25°} = \frac{AE}{\sin 65°} = \frac{(R+20) + (R+35)/\cos 65°}{\sin 65°}$$

$$AP = \frac{\sin 25°(R+20) + (R+35)}{\sin 65°}$$

$$\frac{PC}{\sin 25°} = \frac{CD}{\sin 65°} = \frac{(R+35) + (R+20)/\cos 65°}{\sin 65°}$$

$$PC = \frac{\sin 25° (R+35) + (R+ 20)}{\sin 65°}$$

which yields, after substituting into Equation #3 and a lot of algebra,

$2.023842719\ R^2 + 25.06500002\ R - 3040.254785 = 0$

from which R = 33.0576'

(m = 27°59'19.24" and n = 37°00'40.76")