Comment on Problem 344

I have, since the publication of Vol. 13 No. 3, found another solution to problem 344. $V_1V_2 \ldots V_{18}$ is a regular 18-gon with side 1 unit (see figure 1).

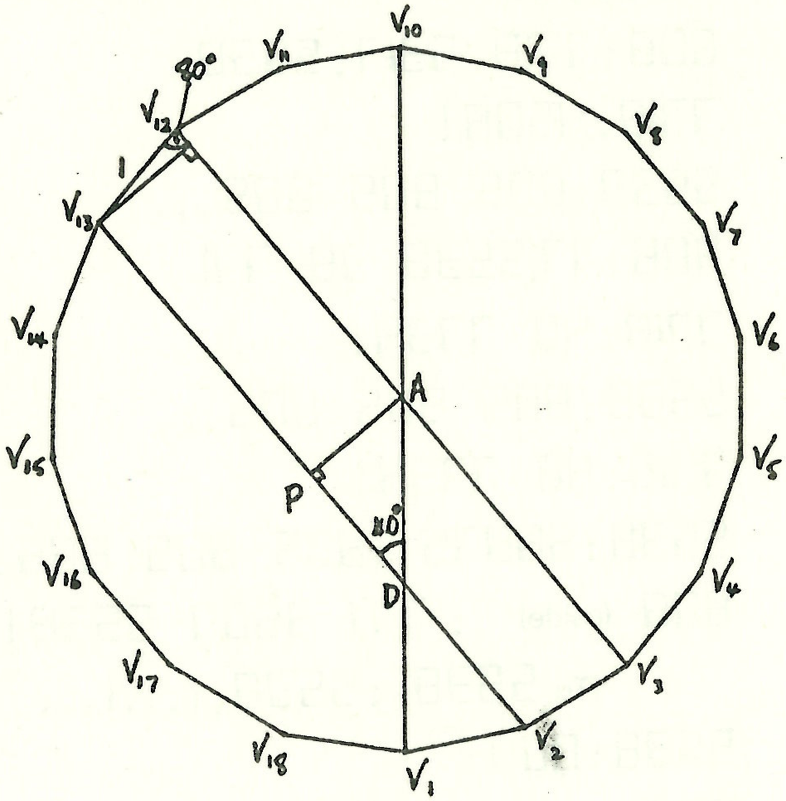

Figure 1

$AP = \sin 80° = 2 \sin 40° \cos 40°$.

$\therefore AD = AP/\sin 40° = 2 \cos 40°$.

From figure 2 we see that

$AQ = ½ + \sin 70° = \sin 30° + \sin 70°$

$= 2 \sin 50° \cos 20°$.

$AD' = AQ/\cos 20° = 2 \sin 50° = 2 \cos 40° = AD$.

$\therefore D = D'$

Now let $V_1 = B$, $V_2 = C$ (see figure 3).

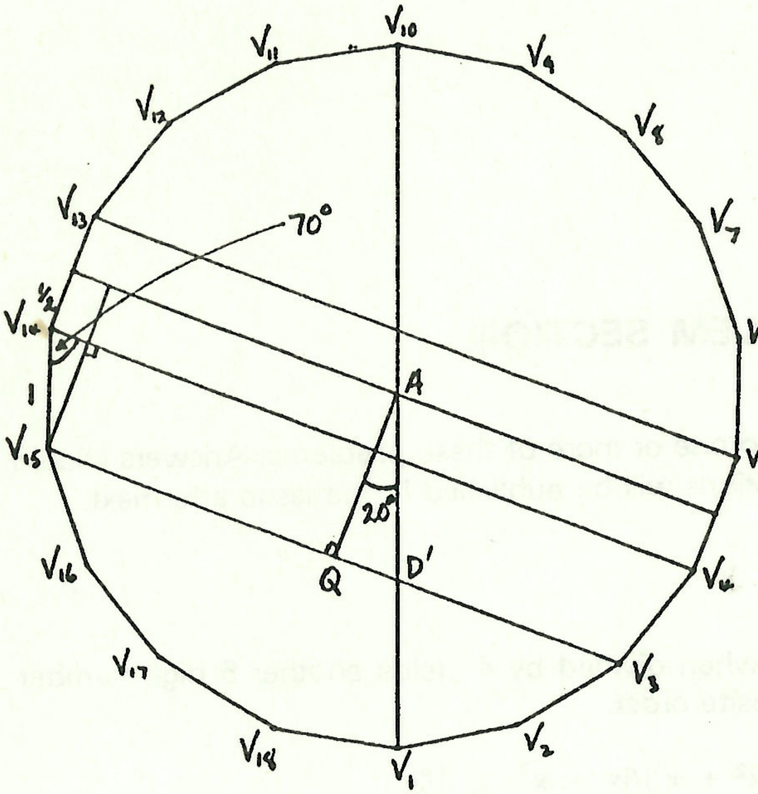

Figure 2

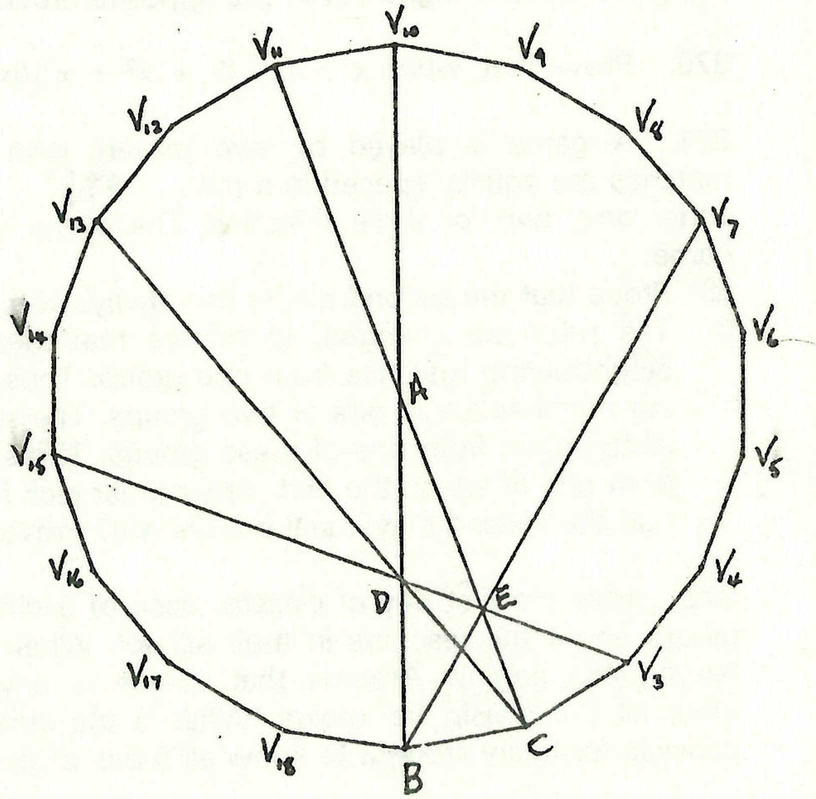

Figure 3

CV_{13} and V_3V_{15} intersect BV_{10} at the same point D (by the above argument). BV_7 and V_3V_{15} intersect CV_{11} at the same point E (by symmetry about CV_{11}). The triangle ABC is then the triangle in problem 344, and it is quite easy to show $\angle CDE = 30°$. See if you can do it!

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