Let s be the length of each side of the square $ABCD$. Place the square in $\mathbb{R}^2$ as follows: $A(0,s)$, $B(0,0)$, $C(s,0)$, and $D(s,s)$. With the pole at the point (x,y) such that $AP = 13$ft, $BP = 5$ ft, and $CP = 17$ ft. We can construct a circle of radius 13 ft centered at A, a circle of radius 5 ft centered at B, and a circle of radius 17 ft centered at C, such that all three circles intersect at point P. The equations of these three circles are:

$$x^2 + (y-s)^2 = 13^2 \tag{1}$$

$$x^2 + y^2 = 5^2 \tag{2}$$

$$(x-s)^2 + y^2 = 17^2 \tag{3}$$

By substituting (2) into (1) and (3), we find

$$x = \frac{s^2-264}{2s} \text{ and } y = \frac{s^2-144}{2s}$$

Substituting both into equation (2) gives us $s^4 - 458s^2 + 45216 = 0$. By quadratic formula $s^2 = 144$ or $s^2 = 314$. Because city ordinance requires a square field of at least 300 square feet only the second option is considered. Using the x and y equations, we find $P = (\frac{25}{\sqrt{314}}, \frac{85}{\sqrt{314}})$. By graphing a circle of radius 21 feet centered at P it can be seen that the circle encompasses the area of the entire square. Through calculus optimization it can found that the closest the circle gets to the square is a distance of .191 ft. Therefore Fido has a total roaming area of 314 square feet satisfying the ordinance.