

Problem 284: Choosing a site addendum: for a non equalateral triangle

$$A = \frac{4}{2}X_1 + \frac{3}{2}X_2 + \frac{5}{2}H_3$$

Minimize drive way lengths (the altitudes of the sub triangles)

$$F(H_1, H_2, H_3) = H_1 + H_2 + H_3 = X_1 + X_2 + H_3$$

rearrange first equation and substitute into second

$$F(H_1, H_2, H_3) = X_1 + X_2 + H_3 = X_1 + X_2 + \frac{24}{10} - \frac{8}{10}X_1 - \frac{6}{10}X_2$$

$$F(H_1, H_2, H_3) = \frac{24}{10} - \frac{2}{10}X_1 - \frac{4}{10}X_2$$

So the minimum driveway distance for a non equalateral right triangle would be to place the house on the vertex opposite the hypotenuse