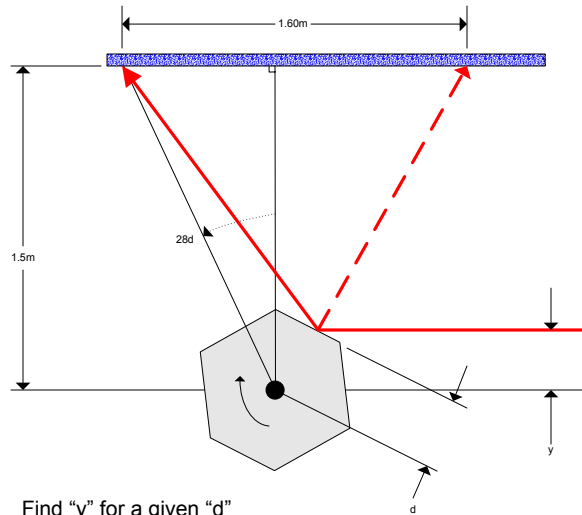
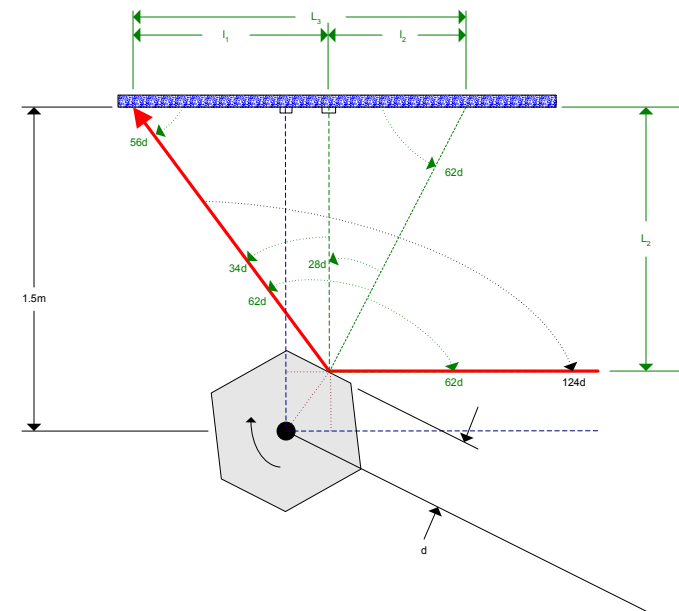
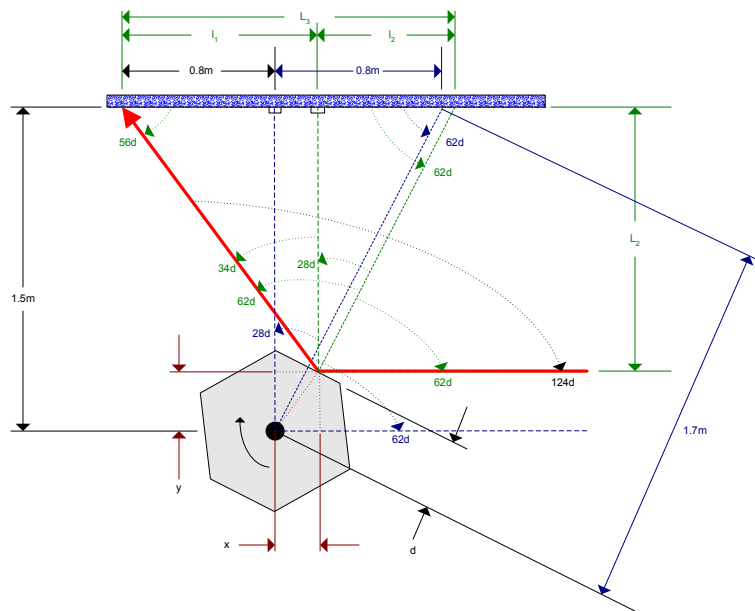
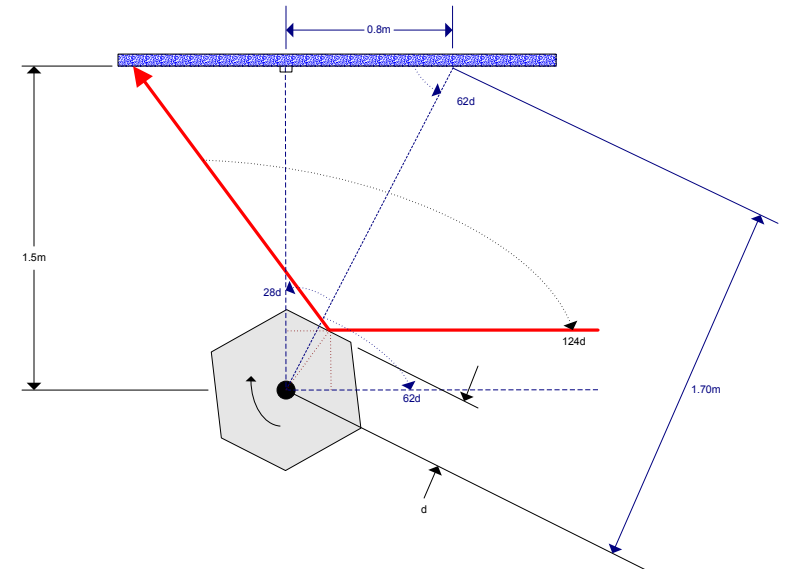


Given:



Find "y" for a given "d"



$$\begin{aligned}\tan(A) &= s / d \\ s &= d \cdot \tan(A) \\ s &= d \cdot \sin(A) / \cos(A)\end{aligned}$$

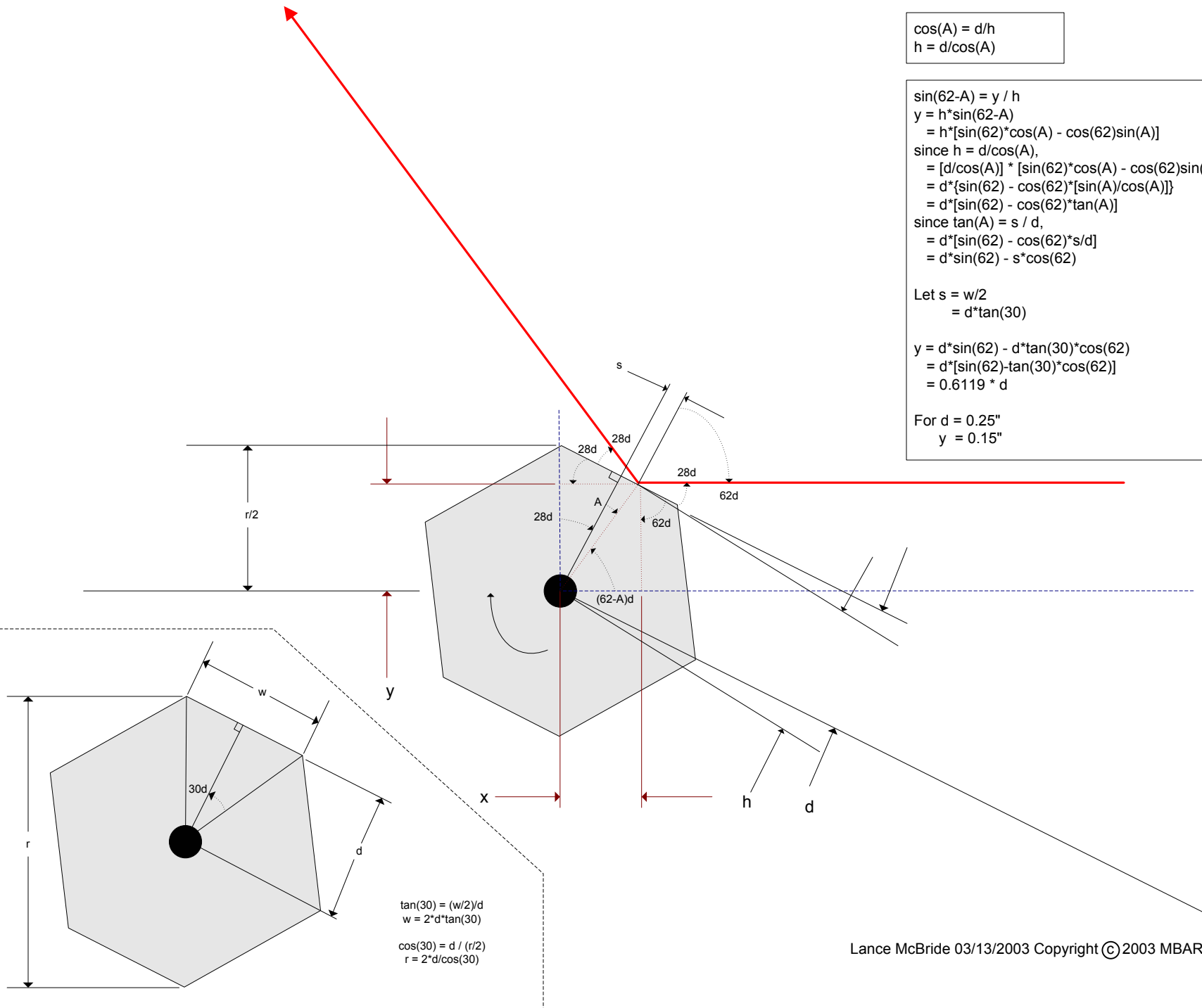
$$\begin{aligned}\cos(A) &= d / h \\ h &= d / \cos(A)\end{aligned}$$

$$\begin{aligned}\sin(62-A) &= y / h \\ y &= h \cdot \sin(62-A) \\ &= h [\sin(62) \cdot \cos(A) - \cos(62) \sin(A)] \\ \text{since } h &= d / \cos(A), \\ &= [d / \cos(A)] \cdot [\sin(62) \cdot \cos(A) - \cos(62) \sin(A)] \\ &= d [\sin(62) - \cos(62) \cdot \sin(A) / \cos(A)] \\ &= d [\sin(62) - \cos(62) \cdot \tan(A)] \\ \text{since } \tan(A) &= s / d, \\ &= d [\sin(62) - \cos(62) \cdot s / d] \\ &= d \sin(62) - s \cos(62)\end{aligned}$$

$$\begin{aligned}\text{Let } s &= w / 2 \\ &= d \cdot \tan(30)\end{aligned}$$

$$\begin{aligned}y &= d \sin(62) - d \tan(30) \cos(62) \\ &= d [\sin(62) - \tan(30) \cos(62)] \\ &= 0.6119 \cdot d\end{aligned}$$

$$\begin{aligned}\text{For } d &= 0.25'' \\ y &= 0.15''\end{aligned}$$



@ a (w*cos(A-30), w*sin(A-30))

@ b (d*cos(A), d*sin(A))

@ c (?, y (=0.15 @ d=0.25))

@ d (w*cos(A+30), w*sin(A+30))

For the line (y = m*x + b) through a, b, c, d :

$$\begin{aligned}\text{slope} &= \frac{w \sin(A+30) - w \sin(A-30)}{w \cos(A+30) - w \cos(A-30)} \\&= w * \frac{\sin(A+30) - \sin(A-30)}{\cos(A+30) - \cos(A-30)} \\&= w * \frac{\sin(A)\cos(30) + \sin(30)\cos(A) - \sin(A)\cos(30) + \sin(30)\cos(A)}{\cos(A)\cos(30) - \sin(A)\sin(30) - \cos(A)\cos(30) - \sin(A)\sin(30)} \\&= w * \frac{2 * \sin(30)\cos(A)}{-2 * \sin(A)\sin(30)} \\&= -w * \frac{\cos(A)}{\sin(A)} \\&= -w * \tan^{-1}(A)\end{aligned}$$

@ point a, x = w * cos(A-30)

$$y = w * \sin(A-30)$$

so,

$$w * \sin(A-30) = -w * \tan^{-1}(A) * w * \cos(A-30) + b$$

$$w * \sin(A-30) + w * \tan^{-1}(A) * w * \cos(A-30) = b$$

therefore,

$$b = w * [\sin(A-30) + w * \tan^{-1}(A) * \cos(A-30)]$$

and

$$y = -w * \tan^{-1}(A) * x + w * [\sin(A-30) + w * \tan^{-1}(A) * \cos(A-30)]$$

so,

$$y_c = -w * \tan^{-1}(A) * x_c + w * [\sin(A-30) + w * \tan^{-1}(A) * \cos(A-30)]$$

and,

$$s = \sqrt{(x_b - x_c)^2 + (y_b - y_c)^2}$$