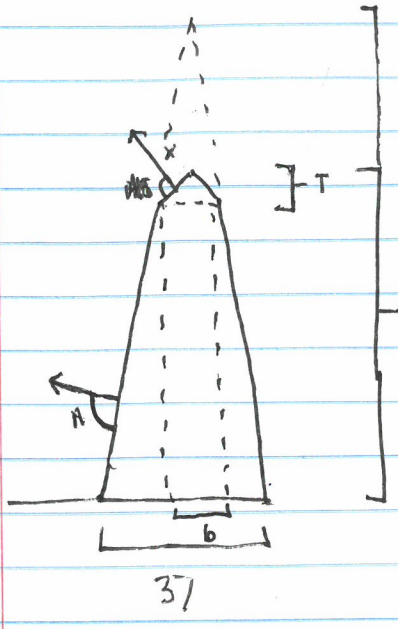
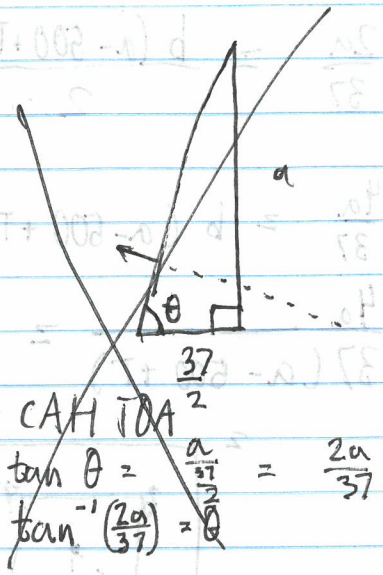
Washington Monument





SOH CAH TOA

$\tan\theta = \frac{a}{\frac{37}{2}} = \frac{2a}{37}$

$\tan^{-1}\left(\frac{2a}{37}\right) = \theta$

Can't find precise data online, so parameterizing

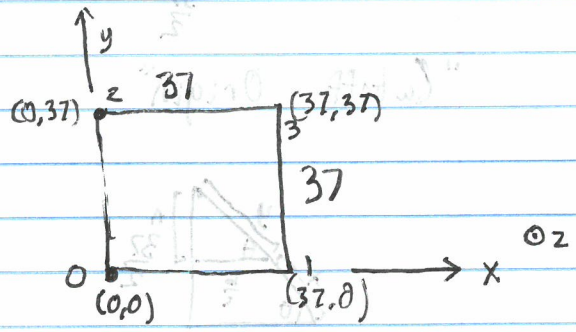
First 4 pts: Base

0 - (0,0,0)

1 - (37,0,0)

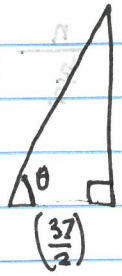
2 - (0,37,0)

3 - (37,37,0)

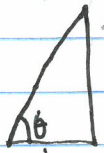


Next 4 pts: Cutoff

Solve for b...



$\theta = \tan^{-1}\left(\frac{2a}{37}\right)$



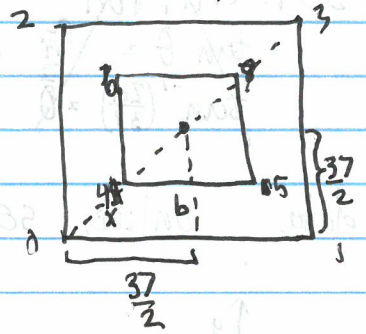
$\tan\left(\tan^{-1}\left(\frac{2a}{37}\right)\right) = \frac{a-500+T}{\frac{b}{2}}$

$$\frac{2a}{37} = \frac{a-500+T}{\frac{2}{b}}$$

$$\frac{2a}{37} = \frac{b(a-500+T)}{2}$$

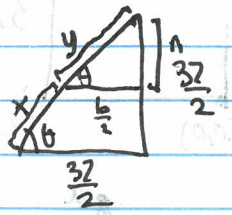
$$\frac{4a}{37} = b(a-500+T)$$

$$\frac{4a}{37(a-500+T)} = b$$



"Cutoff Origin"

SOH CAHTOA



$$x+y = \sqrt{\frac{37^2}{2^2} + \frac{37^2}{2^2}}$$

$$\theta = \tan^{-1}\left(\frac{\frac{37}{2}}{\frac{37}{2}}\right) = 45^\circ$$

$$n \Rightarrow \tan(45^\circ) = \frac{n}{\frac{b}{2}}$$

$$n = \frac{b}{2}$$

$$y = \sqrt{2}\left(\frac{37}{2^2}\right)$$

$$x+y = \sqrt{2}\left(\frac{37}{2}\right)$$

$$y = \sqrt{2}\left(\frac{b}{2}\right)$$

$$x = \sqrt{2}\left(\frac{37-b}{2}\right)$$

$C_x = \sqrt{2}\left(\frac{37-b}{2}\right)$, $b = \frac{4a}{37(a-500+T)}$

$C_y =$ "

4 - $(C_x, C_y, 500-T)$
5 - $(C_x+b, C_y, $ " $)$
6 - $(C_x, C_y+b, $ " $)$
7 - $(C_x+b, C_y+b, $ " $)$

Center (Zenith)

9 - $(\frac{37}{2}, \frac{37}{2}, 500)$

FACES

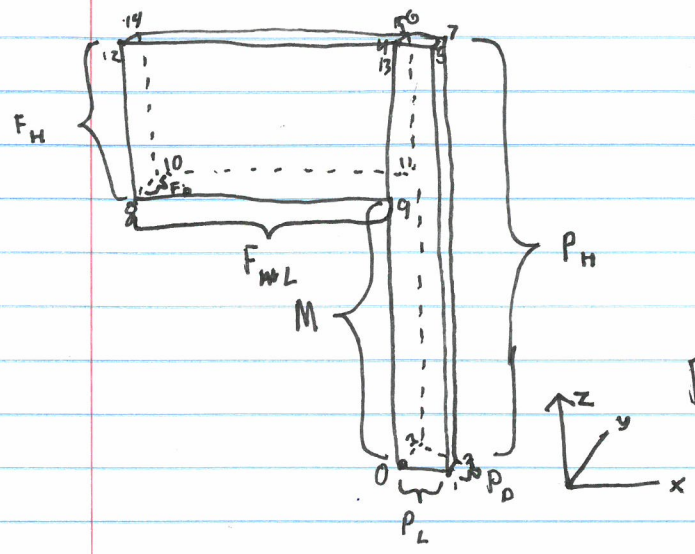
Lower Sides

Face 1 - 0, 1, 4, 5
Face 2 - 1, 3, 5, 7
" 3 - 3, 2, 6, 7
" 4 - 2, 0, 6, 4

Upper Sides

5 - 4, 5, 9
6 - 5, 7, 9
7 - 6, 7, 9
8 - 4, 6, 9

Flag



M can be changed to $\frac{1}{2} P_H$ for half-mast.

Point 0 is origin

POLE

0 - 0, 0, 0
1 - P_L, 0, 0
2 - 0, P_D, 0
3 - P_L, P_D, 0
4 - 0, 0, P_H
5 - P_L, 0, P_H
6 - 0, P_D, P_H
7 - P_L, P_D, P_H

Faces:
0, 1, 4, 5
1, 3, 5, 7
3, 2, 7, 6
2, 0, 6, 4
4, 5, 6, 7
0, 1, 2, 3

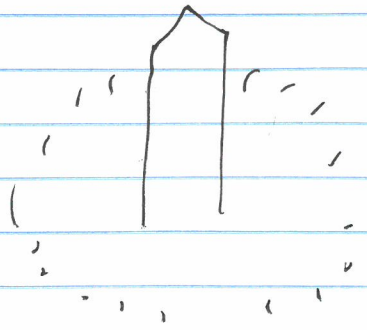
FLAG

Flag origin = $-F_W$, 0, M (8)

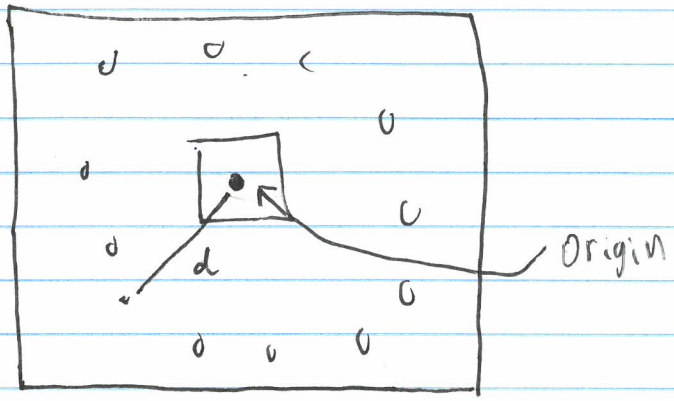
8 - F_x, F_y, F_z
9 - $F_x + F_L$, F_y, F_z
10 - F_x, $F_y + F_d$, F_z
11 - $F_x + F_L$, $F_y + F_d$, F_z
12 -
13 - Like above, except $F_z + F_H$
14
15 -

Faces:
8, 9, 12, 13
9, 11, 13, 15
11, 10, 15, 14
10, 8, 14, 12
8, 9, 10, 11
12, 13, 14, 15

Scene



50 flags surrounding WM

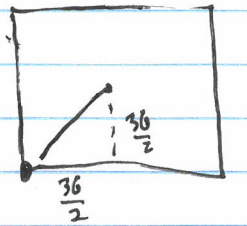


Find (X, Y) coordinates of each flag.

$\theta_F = \frac{360}{50} = \left(\frac{36}{5}\right)^0$

$Flag_i = (d, \theta_F \cdot i)_{radial} = (d\cos(\theta_F \cdot i), d\sin(\theta_F \cdot i), 0)$

Monument Origin



should be @ $\sqrt{2}\frac{36}{2}, \sqrt{2}\frac{36}{2}$