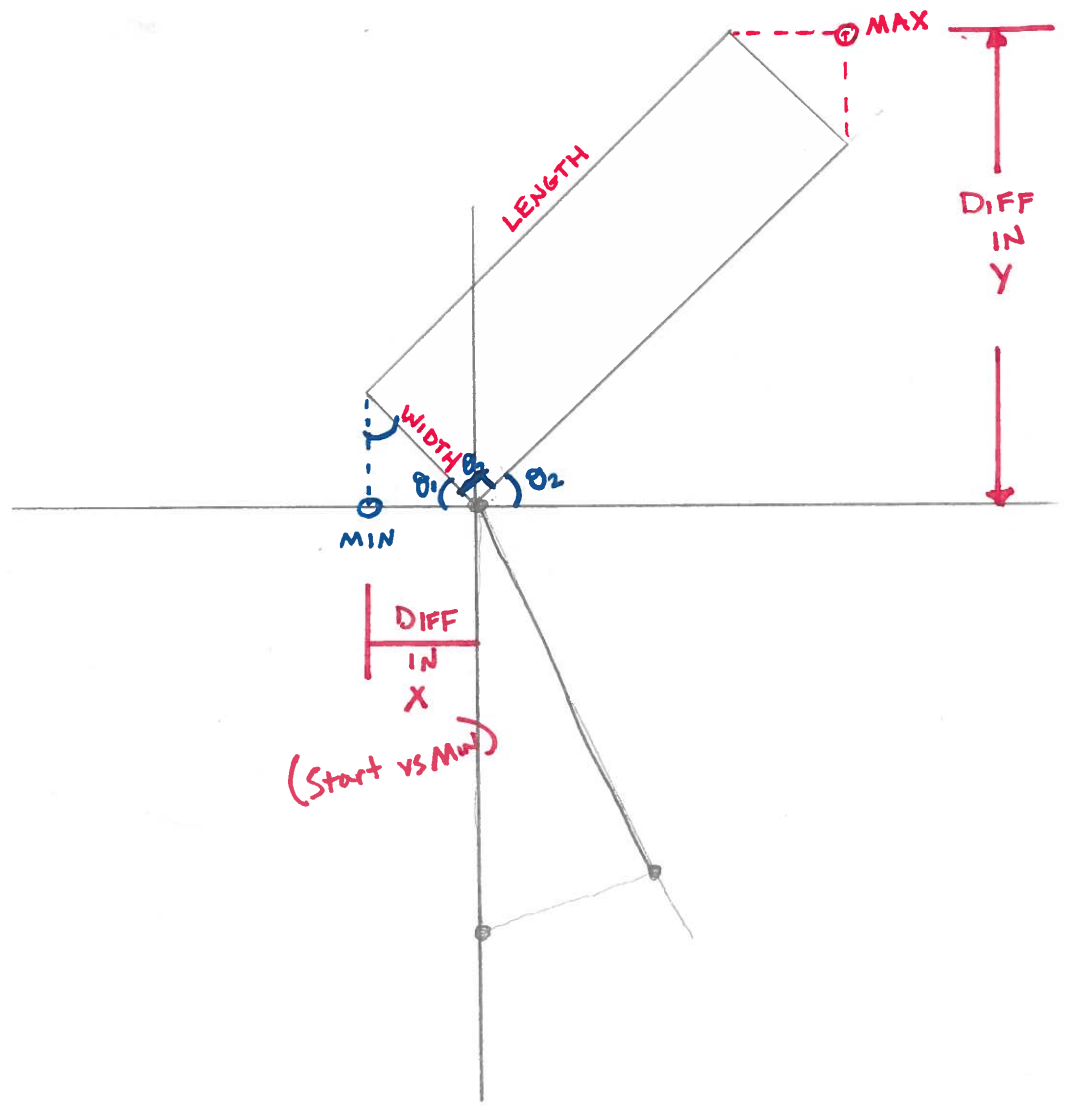
USING MODULE C1 (12'-5" x 32'-9")

WIDTH 12.5
LENGTH 32.75
(MIN) DIFF IN X 8.84
(MAX) DIFF IN Y 32.0

Q1



$\cos\theta_1 = \frac{\text{DIFF IN X}}{\text{WIDTH}}$ (MIN)

$\cos\theta_1 = \frac{8.84}{12.5}$

$\theta_1 = \cos^{-1}(0.7072)$

$\theta_1 = 45$ ✓ CHECKED AGAINST MODEL

$\theta_2 = 90 - \theta_1$ (SINCE THE MODULE HAS A RIGHT ANGLE THAT DIVIDES THESE ANGLE THEY MUST BE THE SUM OF 90.)

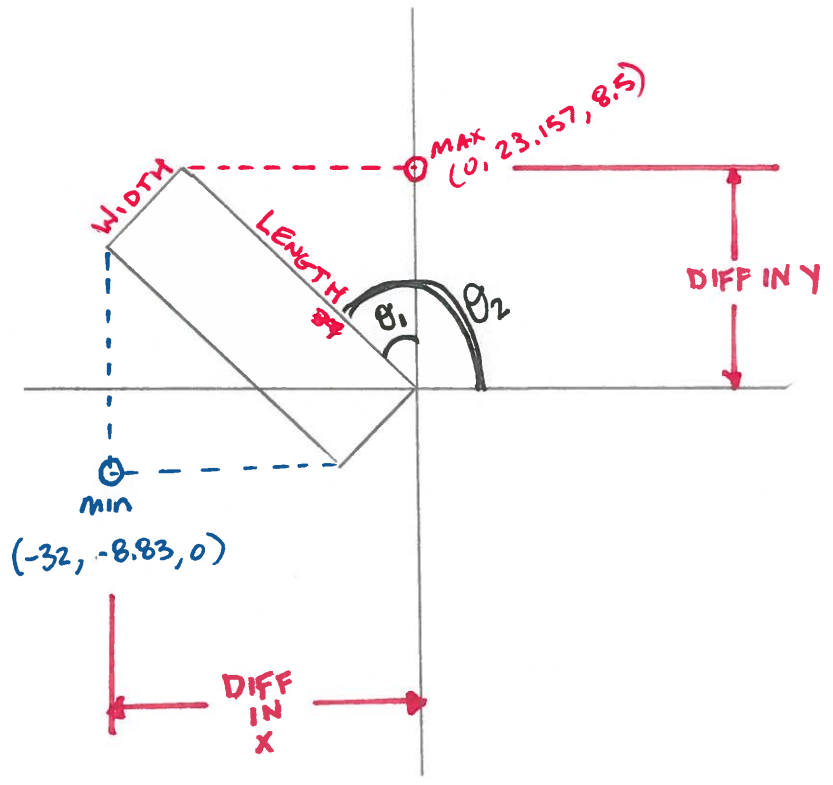
$\theta_2 = 45$ ✓

CHECKED AGAINST MODEL

USING MODULE C1 (12'-5" x 32'-9")

WIDTH 12.5
LENGTH 32.75
(MIN) DIFF IN X 32.0
(MAX) DIFF IN Y 23.157

Q11



$\cos\theta_1 = \frac{\text{DIFF IN Y (MAX)}}{\text{LENGTH}}$

$\cos\theta_1 = \frac{23.157}{32.75}$

$\theta_1 = \cos^{-1}(0.707)$

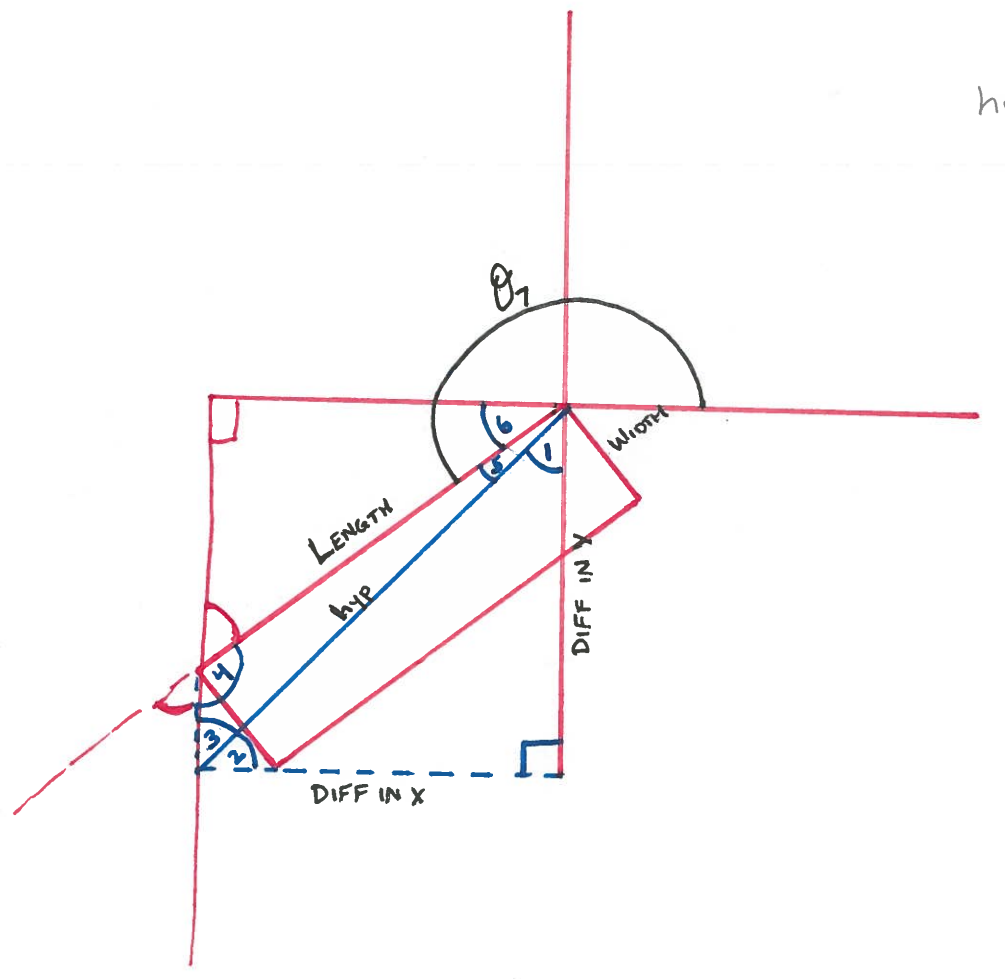
$\theta_1 = 45$ ✓ CHECKED AGAINST MODEL

$\theta_2 = 90 + 45$ ✓ CHECKED AGAINST MODEL

USING MODULE C1 (12'-5" x 32'-9")

QIII

WIDTH	12.5
LENGTH	32.75
(MIN) DIFF IN X	23.16
(MIN) DIFF IN Y	32.00



$\cos(\theta_1) = \frac{\text{DIFF IN Y}}{\text{hyp}}$

$\text{hyp} * \cos(\theta_1) = \text{DIFF IN Y}$

$\text{hyp} = \frac{\text{DIFF IN Y}}{\cos(\theta_1)}$

$\text{hyp} = \frac{32.00}{0.81}$

$\text{hyp} = 39.50$ ✓ CHECKED AGAINST MODEL

$\theta_1 = \text{TAN}^{-1}\left(\frac{\text{DIFF IN X}}{\text{DIFF IN Y}}\right)^{(\text{MIN})}_{(\text{MIN})}$

$\theta_1 = \text{TAN}^{-1}\left(\frac{23.16}{32.00}\right)$

$\theta_1 = \text{TAN}^{-1}(0.72375)$

$\theta_1 = 35.895°$ ✓ CHECKED AGAINST MODEL

$\theta_2 = 90 - 35.895$

$\theta_2 = 54.105°$ ✓ CHECKED AGAINST MODEL

$\theta_5 = 180 - \theta_3 - \theta_4$ Supplement

$\theta_5 = 180 - 35.895 - 135.00$

$\theta_5 = 9.105$ ✓ CHECKED AGAINST MODEL

$\theta_3 = 90 - 54.105$

$\theta_3 = 35.895°$ ✓ CHECKED AGAINST MODEL

$\theta_6 = 90 - \theta_5 - \theta_1$

$\theta_6 = 90 - 9.105 - 35.895$

$\theta_6 = 45$ ✓ CHECKED AGAINST MODEL

$\frac{\text{LENGTH}}{\sin(\theta_3)} = \frac{\text{hyp}}{\sin(\theta_4)}$

$\sin(\theta_4) = \frac{\text{hyp} * \sin(\theta_3)}{\text{LENGTH}}$

$\theta_4 = \sin^{-1}\left(\frac{\text{hyp} * \sin(\theta_3)}{\text{LENGTH}}\right)$

$\theta_4 = \sin^{-1}\left(\frac{39.50 * 0.5863}{32.75}\right)$

$\theta_4 = \sin^{-1}(0.7071)$

$\theta_4 = 45.00$ X

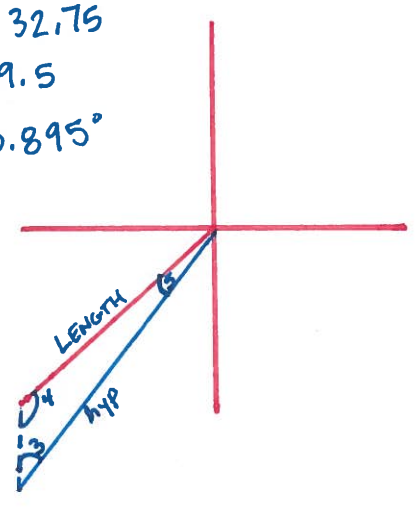
The sin of an obtuse angle is equal to that of its supplement

Here we are getting the supplement 135.00 = Supplement

LENGTH = 32.75

hyp = 39.5

$\theta_3 = 35.895°$



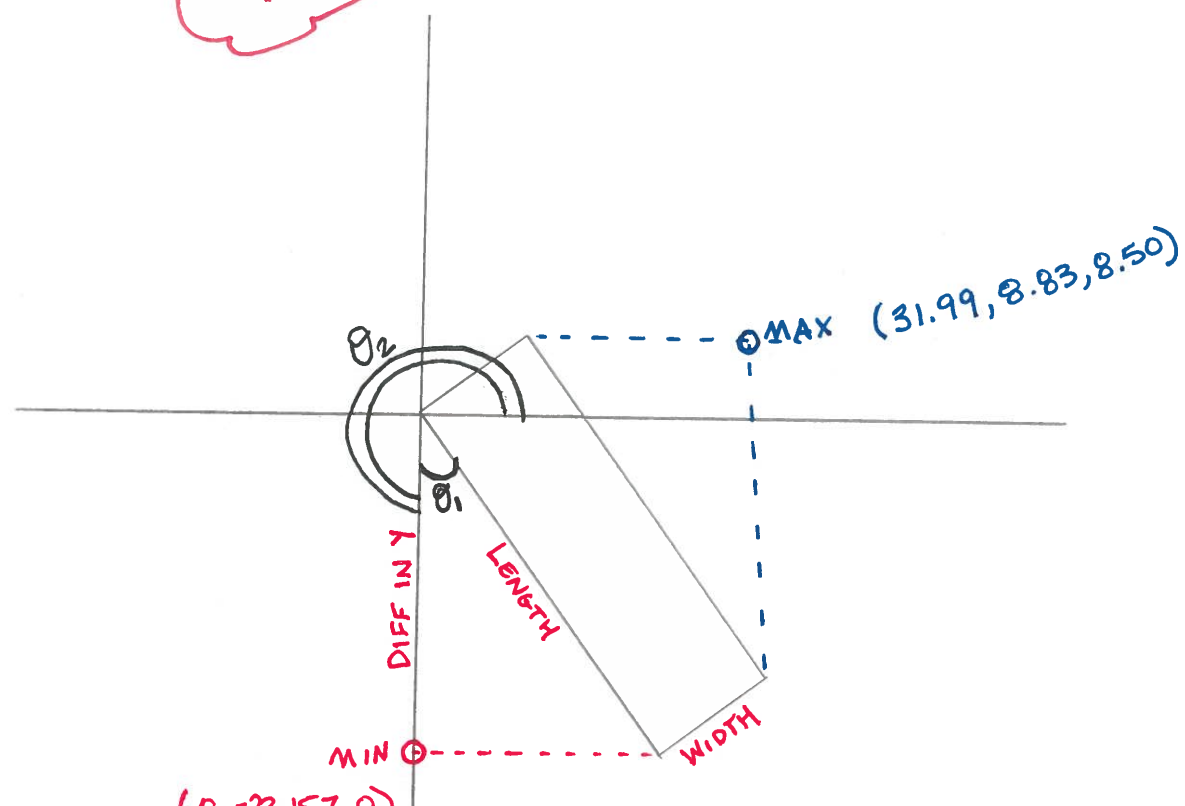
$\theta_7 = 180 + \theta_6$

$\theta_7 = 180 + 45$

$\theta_7 = 225$ ✓ CHECKED AGAINST MODEL

USING MODULE C1 (12'-5" x 32'-9")

QIV



WIDTH 12.5
LENGTH 32.75
(MAX) DIFF IN X 32.00
(MIN) DIFF IN Y 23.16

$$\cos\theta_1 = \frac{\text{DIFF IN Y (MIN)}}{\text{LENGTH}}$$

$$\cos\theta_1 = \frac{23.16}{32.75}$$

$$\cos\theta_1 = 0.7017$$

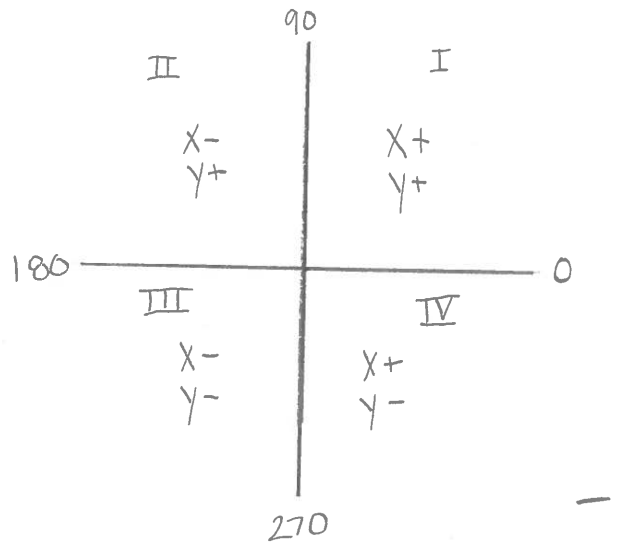
$$\theta_1 = \cos^{-1}(0.7017)$$

$$\theta_1 = 45.00$$ ✓ CHECKED AGAINST MODEL

$$\theta_2 = 270 + \theta_1$$

$$\theta_2 = 270 + 45$$

$$\theta_2 = 315$$ ✓ CHECKED AGAINST MODEL



II

Limit
$x \to -\infty$

MAX X ≤ 0
MIN X = 0

MAX X = 0
LENGTH ≥ MAX Y ≥ 0

$-(\text{WIDTH}) \geq \text{MIN X} \leq 0$

$-(\text{WIDTH}) \geq \text{MIN Y} \leq 0$

III

LIMIT
$x \to 0$

$\geq$ MIN X = 0

$-(\text{WIDTH}) \leq \text{MIN Y} \leq -(\text{LENGTH})$

WIDTH ≤ MAX X ≥ 0
MAX Y = 0

MIN X = 0
MIN Y -

MAX X = 0
MAX Y +

MIN X -
MIN Y = 0

MAX X - INSERTION X = 0
MAX Y - INSERTION Y = LENGTH
MIN X - INSERTION X = WIDTH
MIN Y - INSERTION Y = 0

MAX = INSERTION
MIN X - INSERTION X = 0
MIN Y - INSERTION Y = WIDTH

MAX = INSERTION

MAX
MIN
MAX
MIN
MAX
MIN

QII
QI
QIII
QIV

INSERTION POINT (ALWAYS 0,0)

HOME POSITION (270°)

I

Limit
$x \to 0$

MAX X ≥ 0
MIN X = 0

Length ≤ MAX X > 0
Length < MAX Y > WIDTH

MAX X +
MAX Y +

$-(\text{WIDTH}) \geq \text{MIN X} \leq 0$
MIN Y = 0

MIN = INSERTION
MAX X - INSERTION X = LENGTH
MAX Y - INSERTION Y = WIDTH

MAX X - INSERTION X = WIDTH
MAX Y - INSERTION Y = 0

MIN X - INSERTION X = 0
MIN Y - INSERTION Y = LENGTH

MAX X +
MAX Y = 0

IV

Limit
$x \to \infty$

MIN X ≤ 0
MAX X ≥ 0

MIN X = 0
$-(\text{LENGTH}) \geq \text{MIN Y} < 0$

LENGTH ≤ MAX X > 0
WIDTH < MAX Y ≥ 0