

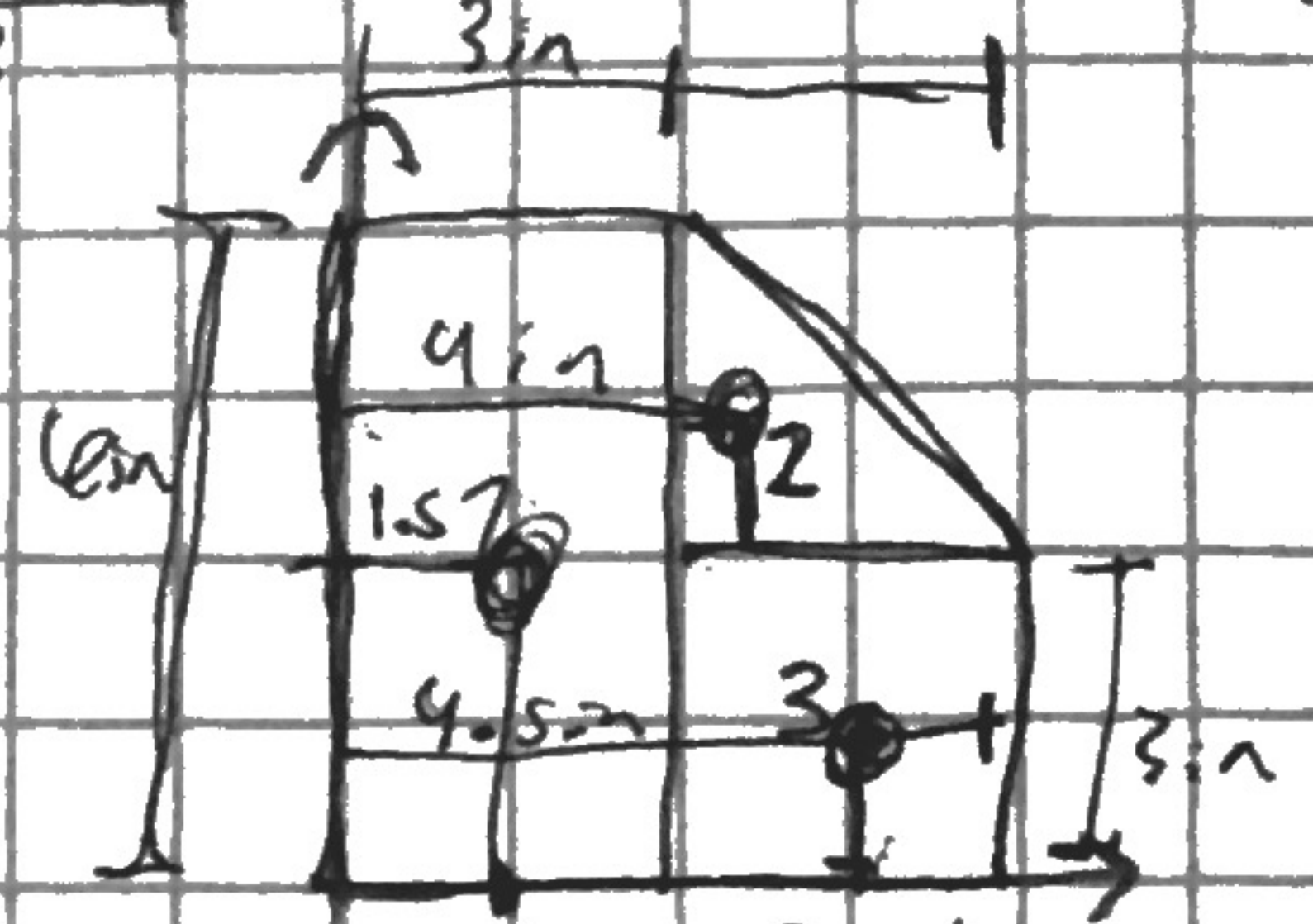
$$\frac{4r}{3\pi}$$

$$\frac{4r}{3\pi} = \frac{4 \cdot 2 \cdot \pi}{3\pi} = 0.849 \text{ in} = 0.8 \text{ in}$$

### Centroid location Equations

Complex shapes

$$\bar{X} = \frac{\sum \bar{x}_i A_i}{\sum A_i} \quad \bar{Y} = \frac{\sum \bar{y}_i A_i}{\sum A_i}$$



Step 1: Divide shape into simple shapes

2: Determine a reference axis

3: Calculate area of each shape

4: Determine centroid location of each shape

5: Determine distance from each centroid to reference axis (x and y)

6: multiply each shapes area by its distance from centroid to reference axis

7: Sum of products

8: sum of all area

9: divide sum of product

$$A \# 1 = 18 \text{ in}^2$$

$$A \# 2 = 9.5 \text{ in}^2$$

$$A \# 3 = 9 \text{ in}^2$$

$$C \# 1 = 1.5 \text{ and } 3$$

$$C \# 2 = 1 \text{ and } 1$$

$$C \# 3 = 1.5 \text{ and } 4.5$$

Kyle Marquez 2/16/16



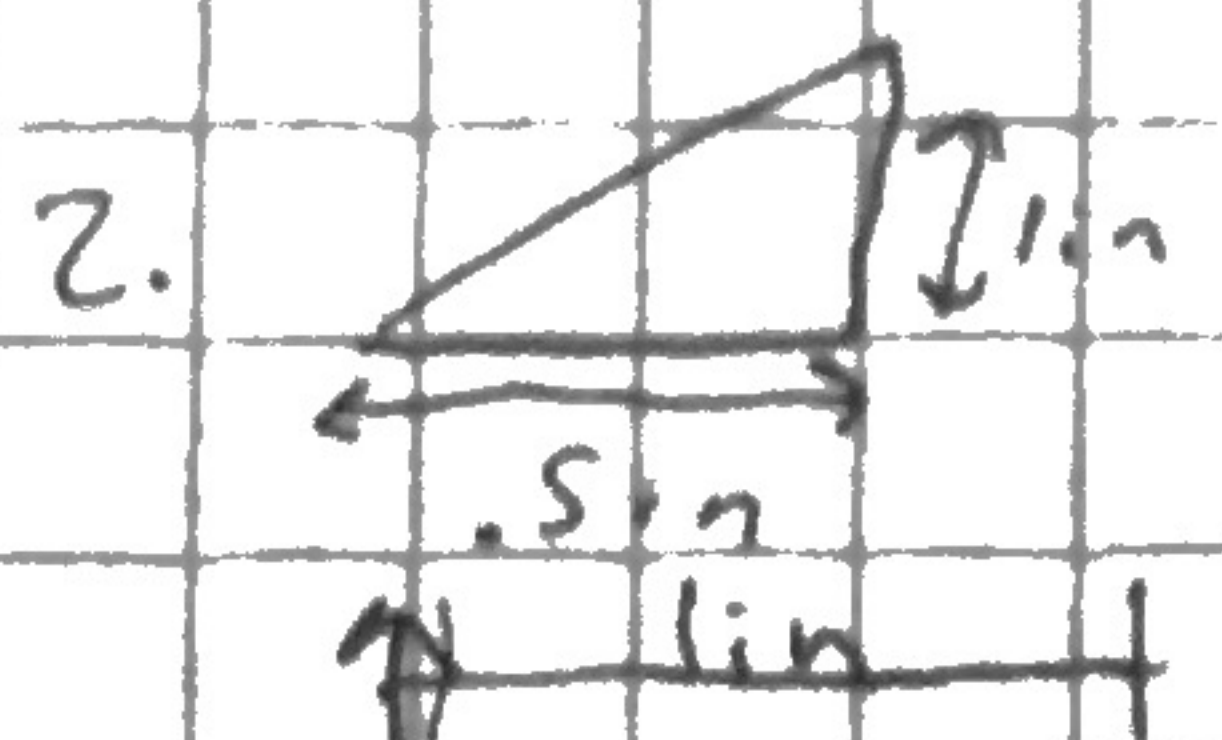
Activity: Centroids



Formula  
 $\frac{B}{2} \quad \frac{H}{2}$

Value  
 $\frac{.75}{2} \quad \frac{.5}{2}$

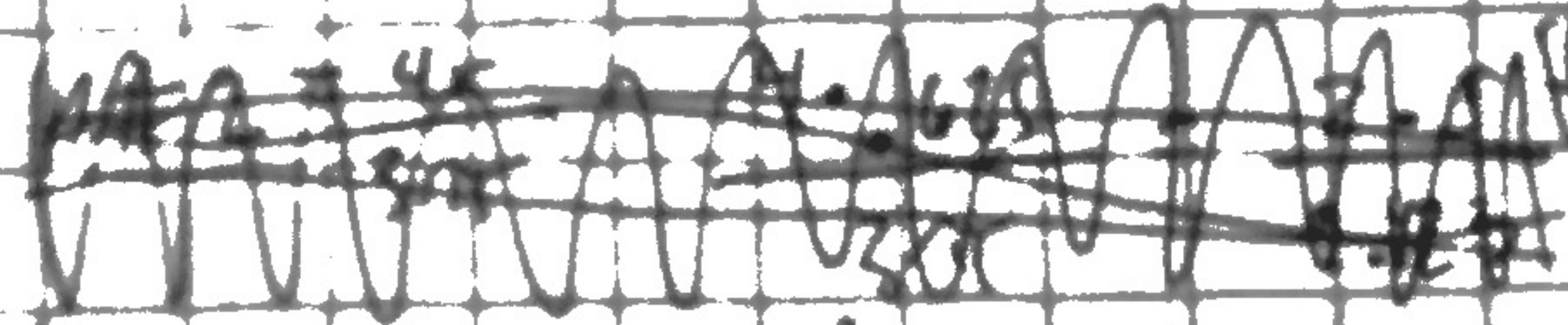
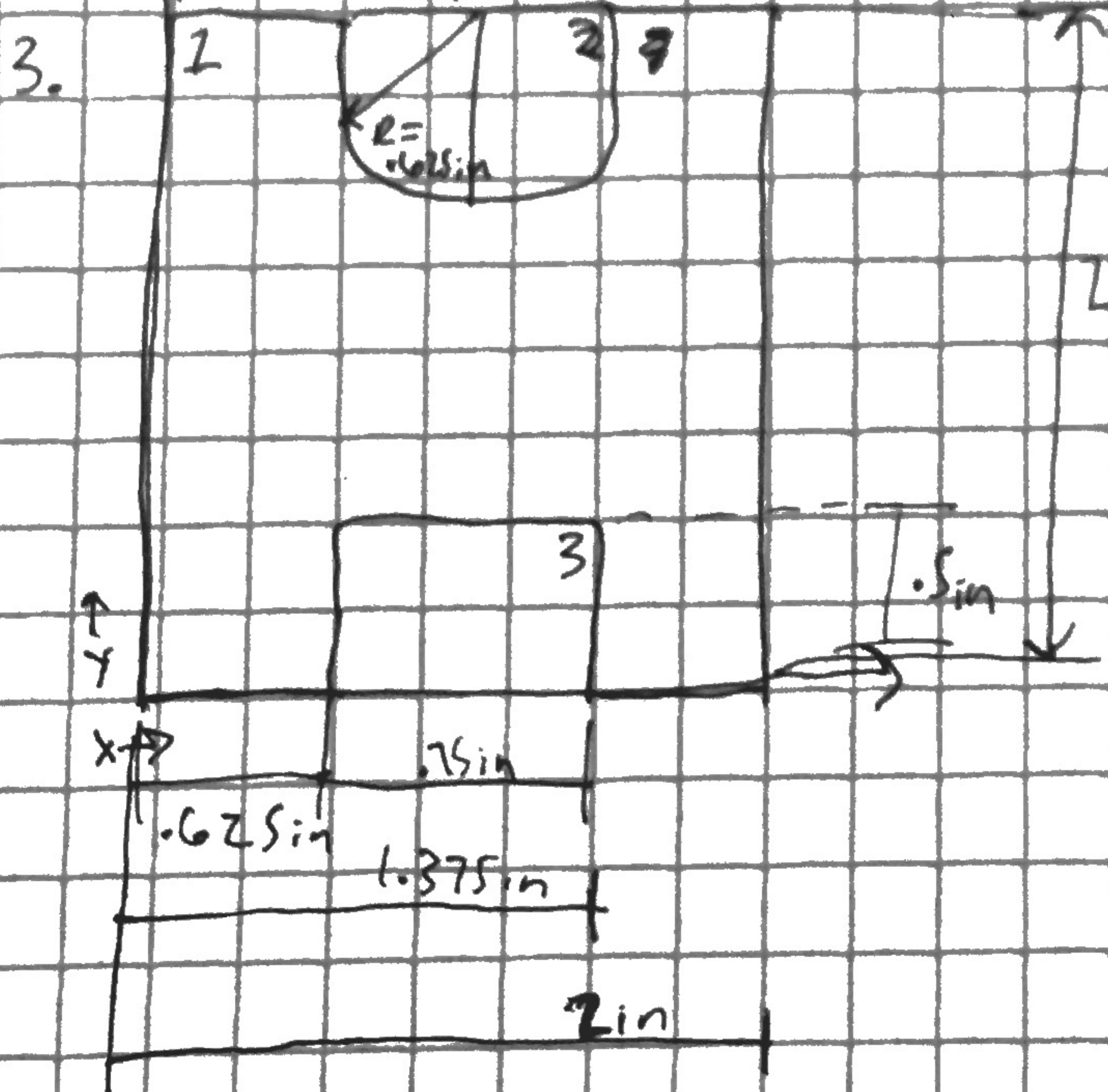
Final  
 .375 .25



$\frac{B}{3} \quad \frac{H}{3}$

$\frac{.5}{3} \quad \frac{1}{3}$

.167 .33



$A \# 2 = \pi r^2 \quad \pi \cdot .625^2 = 1.2 \text{ in}^2$

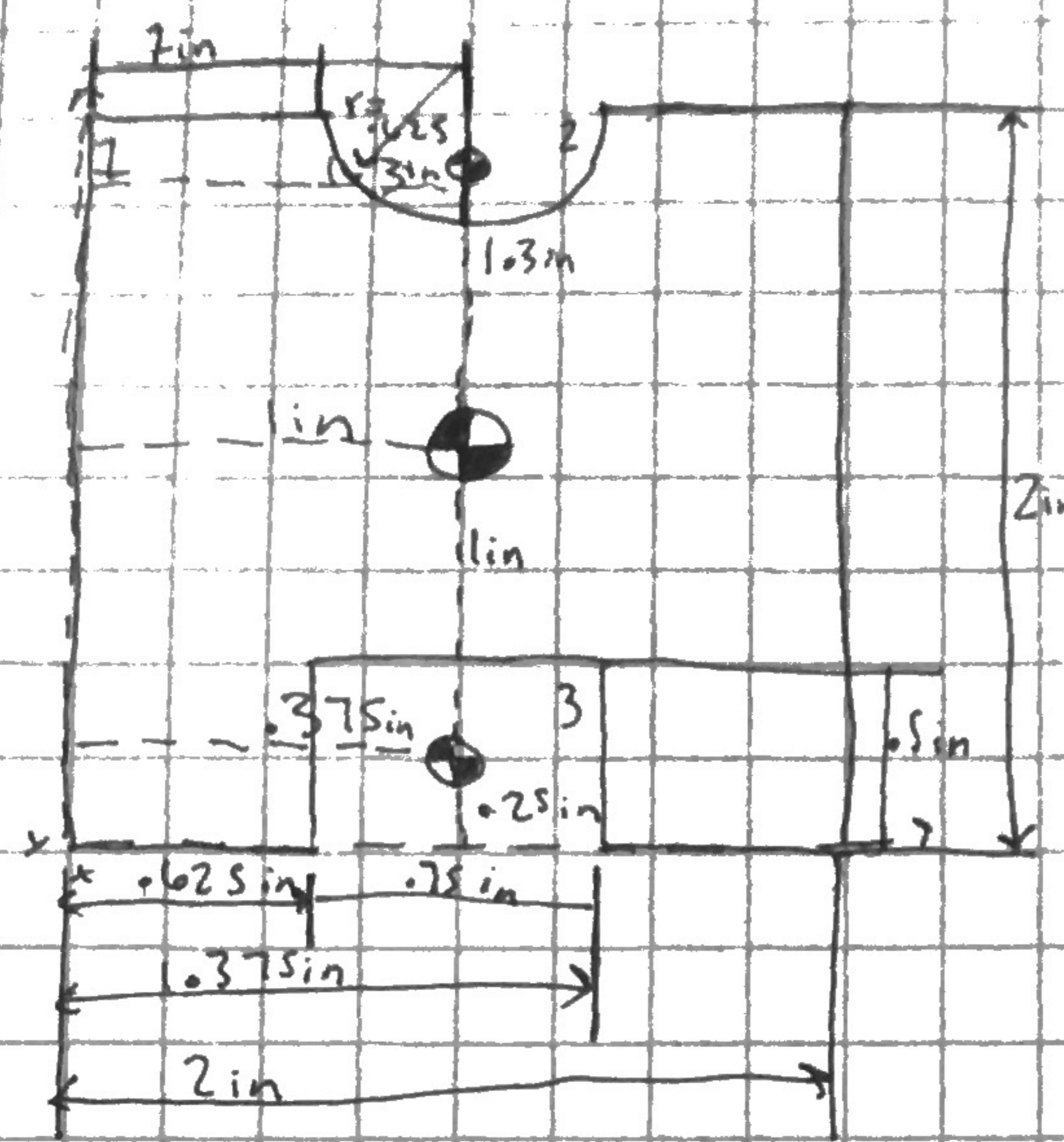
$A \# 3 = 1.375 \text{ in} \cdot .625 = .859 \text{ in}^2$

$A \# 4 = 1.2 + .859 = 2.059 \text{ in}^2$

$C \# 2 = \frac{4r}{3\pi} \quad \frac{4(.625)}{3\pi} = 2.6 \text{ in}$

$C \# 3 = \frac{B}{2} \quad \frac{H}{2} \quad \frac{.75}{2} = .375 \text{ in} \quad \frac{.5}{2} = .25 \text{ in}$





$A\#1 = w \times h = 2 \text{ in} \times 2 \text{ in} = 4 \text{ in}^2$   
 $A\#2 = \frac{\pi r^2}{2} = \frac{\pi (0.25)^2}{2} = 0.6 \text{ in}^2$   
 $A\#3 = w \times h = 0.75 \times 0.5 = 0.375 \text{ in}^2$

	$\frac{b}{2}$	$\frac{h}{2}$	$x$	$y$
$C1\#1$	$\frac{2}{2}$	$\frac{2}{2}$	0.375	0.25
$C1\#2$	$\frac{4r}{3\pi}$	$\frac{4(0.25)}{3\pi}$	2.0	2.0
$C1\#3$	$\frac{b}{2}$	$\frac{h}{2}$	1	1

	$y_i$	$A_i$	$y_i A_i$
1	1	4	4
2	1.735	-0.61	-1.058
3	0.25	-0.375	-0.09375
Total:		3.015	2.84825
	$x_i$	$A_i$	$x_i A_i$
1	1	4	4
2	1	-0.61	-0.61
3	1	-0.375	-0.375
Total:		3.015	3.015

	$y_i$	$A_i$	$y_i A_i$
1			
2			
3			
Total:			