



Bonus-1

Student Name: _____

Grade: $\frac{\quad}{5}$

1- Write the X and Y coordinates of the points shown in Figure 1.

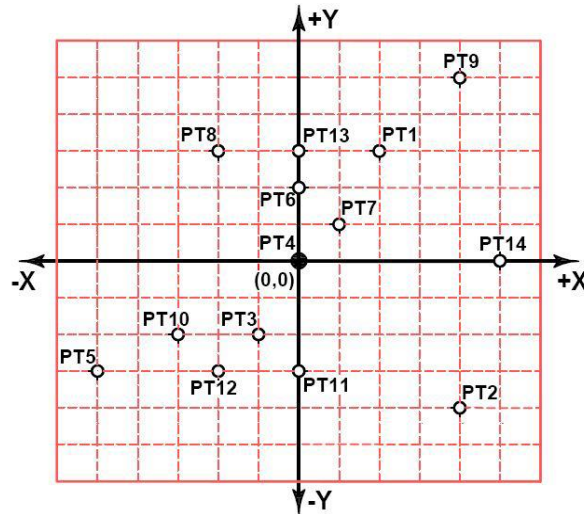


FIGURE 1

POINT	Absolute Coordinates		Incremental Coordinates	
	X	Y	X	Y
1	2	3	2	3
2	4	-4	2	-7
3	-1	-2	-5	2
4	0	0	1	2
5	-5	-3	-5	-3
6	0	2	5	5
7	1	1	1	-1
8	-2	3	-3	2
9	4	5	6	2
10	-3	-2	-7	-7
11	0	-3	3	-1
12	-2	-3	-2	0
13	0	3	2	6
14	5	0	5	-3



2- Write the **X** and **Y** coordinates of the center of each hole for the hole pattern dimensioning given in **Figure 1-1**.

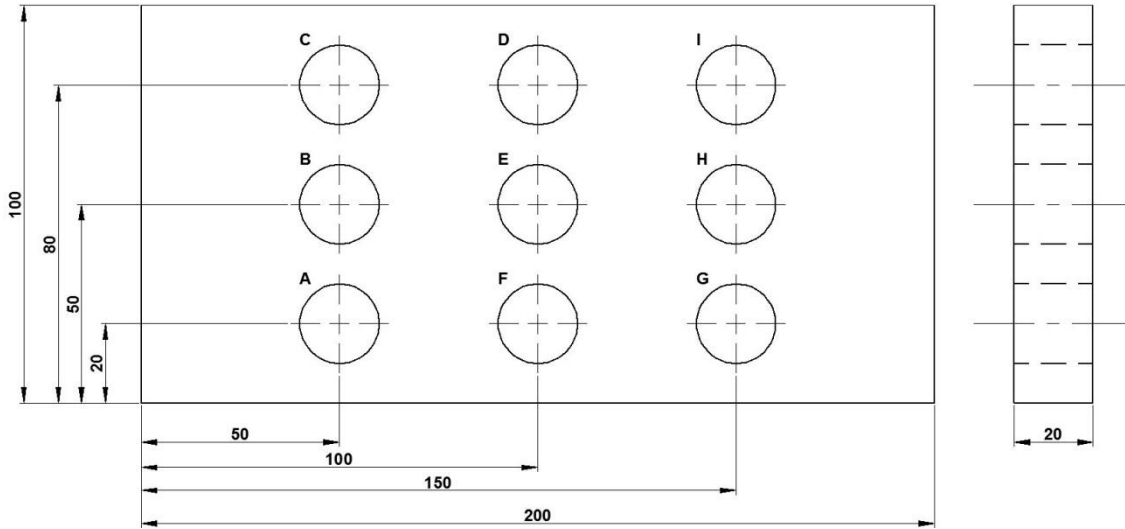


FIGURE 1-1

HOLE	Absolute Coordinates		Incremental Coordinates	
	X	Y	X	Y
A	50	20	50	20
B	50	50	0	30
C	50	80	0	30
D	100	80	50	0
E	100	50	0	-30
F	100	20	0	-30
G	150	20	50	0
H	150	50	0	30
I	150	80	0	30



3- Find the absolute X and Y coordinates that must be input for drilling hole 2 shown in Figure 1-2. [Hint: use right-triangle to find the X and Y]

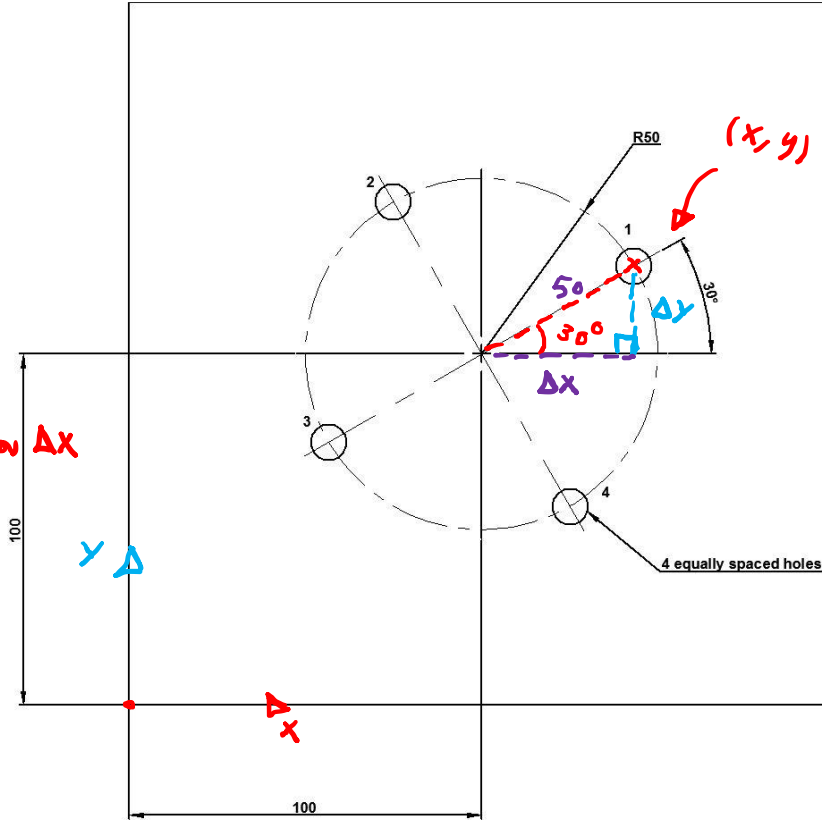


FIGURE 1-2

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$$\sin \theta^\circ = \frac{\text{OPP}}{\text{HYP}}$$

$$\cos \theta^\circ = \frac{\text{adj}}{\text{HYP}}$$

$$\tan \theta^\circ = \frac{\text{OPP}}{\text{adj}}$$

for ΔX

solution for Δy:

$$\frac{\sin \theta^\circ}{1} = \frac{\text{OPP}}{\text{HYP}}$$

$$\text{OPP} = \sin \theta^\circ \text{ HYP} = \sin(30^\circ) \times 50 = 0.5 \times 50 = 25 \quad \square = \Delta y$$

solution for ΔX:

$$\frac{\cos \theta^\circ}{1} = \frac{\text{adj}}{\text{HYP}} \Rightarrow \text{adj} = \cos \theta^\circ \text{ HYP} = \cos(30^\circ) \times 50 = 43.3 \quad \square = \Delta X$$

$$\frac{\tan \theta^\circ}{1} = \frac{\text{OPP}}{\text{adj}} \Rightarrow \text{OPP} = \tan \theta^\circ \text{ adj} \Rightarrow \frac{1}{\text{OPP}} \times \text{OPP} = \frac{1}{\text{OPP}} \times \tan \theta^\circ \text{ adj}$$

$$\frac{1}{\text{adj}} \times 1 = \frac{\tan \theta^\circ}{\text{OPP}} \text{ adj} \times \frac{1}{\text{adj}} \Rightarrow \frac{1}{\text{adj}} = \frac{\tan \theta^\circ}{\text{OPP}} \Rightarrow \text{adj} = \frac{\text{OPP}}{\tan \theta^\circ} = \frac{25}{\tan(30^\circ)} = 43.3$$