Building A Box

NAME _____

Emma got a new job at the Acme Box Factory. Her job is to construct cubes that will be used as jewelry boxes. Her boss, Ron, showed her the company's current blueprint for making these boxes (Figure 1). He explained, "This shape is called a *net*. A net is a flat figure that can be cut out and folded into a box. This net can be folded into a cube that measures 3 centimeters on each side."

Emma was then instructed to cut out Figure 1 and fold it into a cubical box. (You may also want to do this.)

"Your job," Ron continued, "is to draw as many of these nets as you can, cut them out, and fold them into cubes."

"Do all my nets have to look like this one?" asked Emma.

"Well, I guess they don't have to look like that… but how else could they look?" inquired Ron.

Emma quickly sketched out another net (Figure 2) and exclaimed, "Wouldn't this also work?"

"Yeah, maybe," said Ron skeptically. "It doesn't matter to me how you do it. You can make the nets anyway you want, as long as you end up with cubes measuring 3 centimeters on each edge."

"Great!" replied Emma. "I wonder how many ways there are to make such a net?"

Your task is to help Emma answer this question:

How many different nets can you draw that can be folded into a cube?

Use the grid paper to draw and test several net designs, and then count and label each of the different figures. Carefully explain how you know that you have found all possible nets that will form a cube.
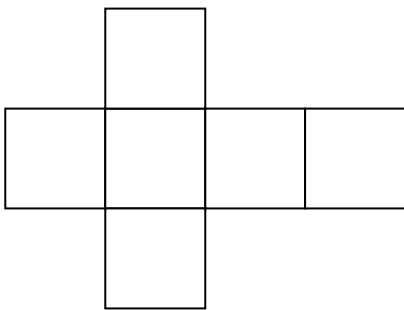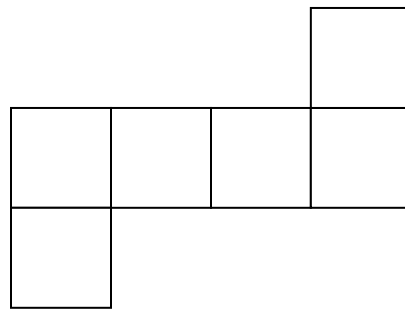
Figure 1.   **Figure 2.**