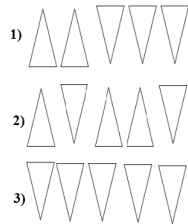
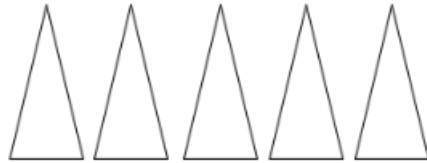
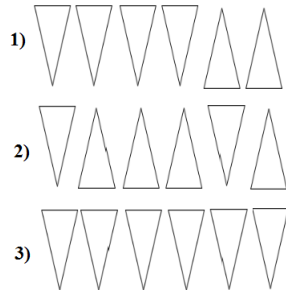


- Below are 5 triangles facing upward. Your goal is to flip all triangles to face downward, but you can only flip 3 triangles at a time. A *flip* turns a triangle facing up into a triangle facing down and a triangle facing down into a triangle facing up. Draw all the steps in your solution.



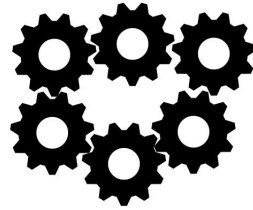
**Solution:**

- What if you have 6 triangles facing upward and you can only flip 4 at a time. Can you still flip all of them downward? If you can, show how!

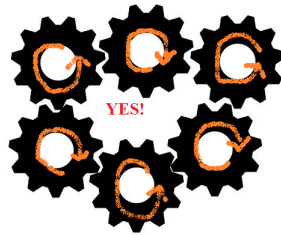


**Solution:**

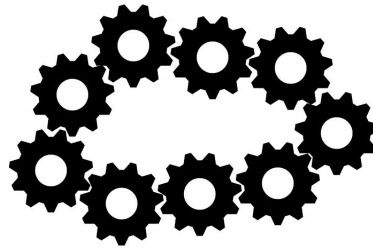
3. For each of the gear systems below, decide if the gear systems can turn at the same time or not.



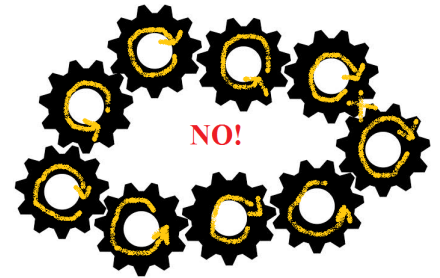
a)



Solution:

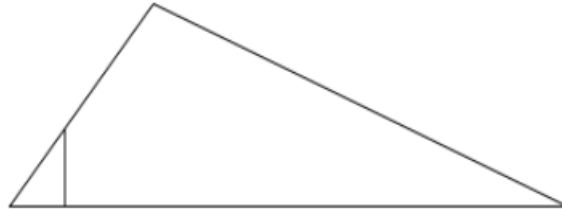


b)



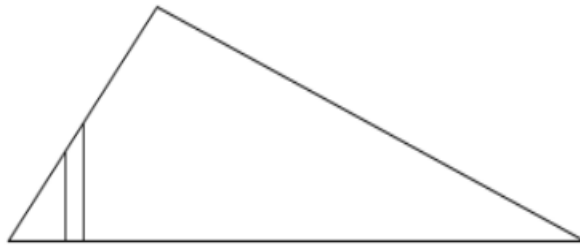
Solution:

4. How many triangles are there in the picture below?



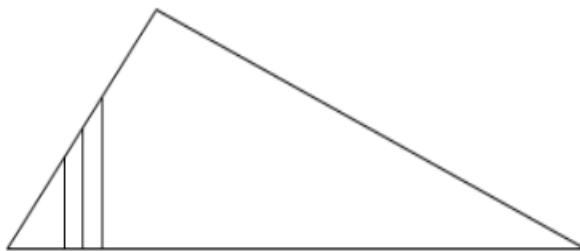
**Solution: 2**

5. How many triangles are there in the picture below?



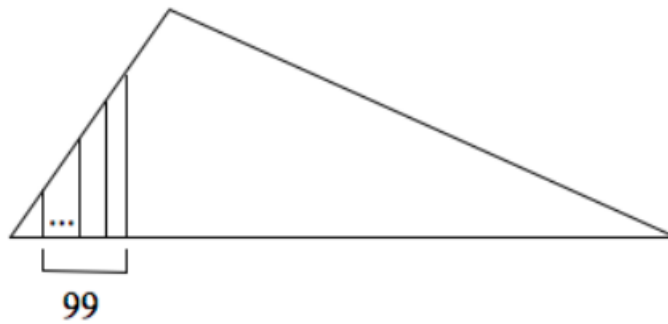
**Solution: 3**

6. How many triangles are there in the picture below?



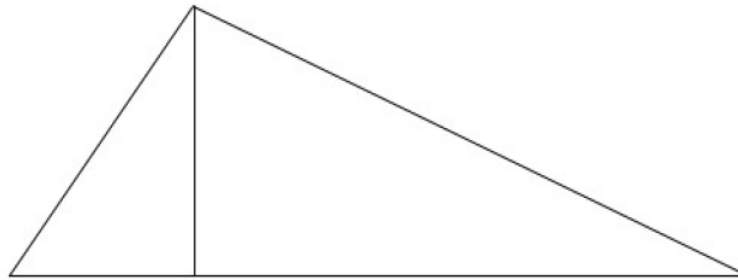
**Solution: 4**

7. How many triangles are there in the picture below, if there is a total of 99 lines connecting two of the triangle's sides?



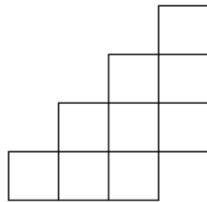
**Solution: 100**

8. How many triangles are there in the picture below ?

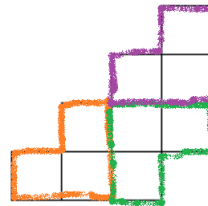


**Solution: 3**

9. Cut the shape below into 3 equal shapes:



**Solution:**



Extra Problems!

1. If you add Melinda's favorite number to Ada's favorite number you get Lauren's favorite number.

Lauren's favorite number is 3 more than Melinda's favorite number.

Ada's favorite number is 6 less than Lauren's favorite number.

What is Lauren's favorite number?

**Solution: Lauren's favorite number is 9, Melinda's favorite number is 6, Ada's favorite number is 3.**

2. One bacteria was placed in a dish. Every second, each bacteria divides into 2. How many bacteria will there be in the dish after 4 seconds?

**Solution: 16 bacteria**

3. Kate and Jan decided to meet on the train. They agreed to go to the 5th car of the train. Kate counted the 5th car from the front. Jan counted the 5th car from the back. They ended up in the same car. How many cars are there in this train?

**Solution: 9 cars**

4. The jogging path in the park is 100 meters long. There are lamp posts along the path. The first lamp post is at the beginning of the path. The last lamp post is at the end of the path. If the lamp posts are 10 meters apart, how many lamp posts are there in all?

**Solution: 11 posts**