Pascal's Triangle
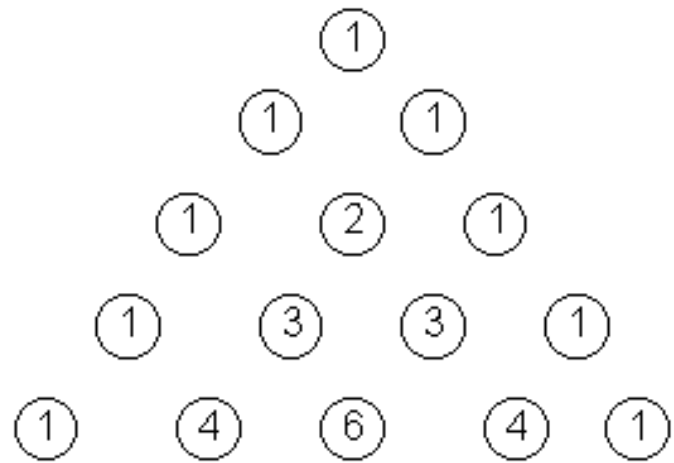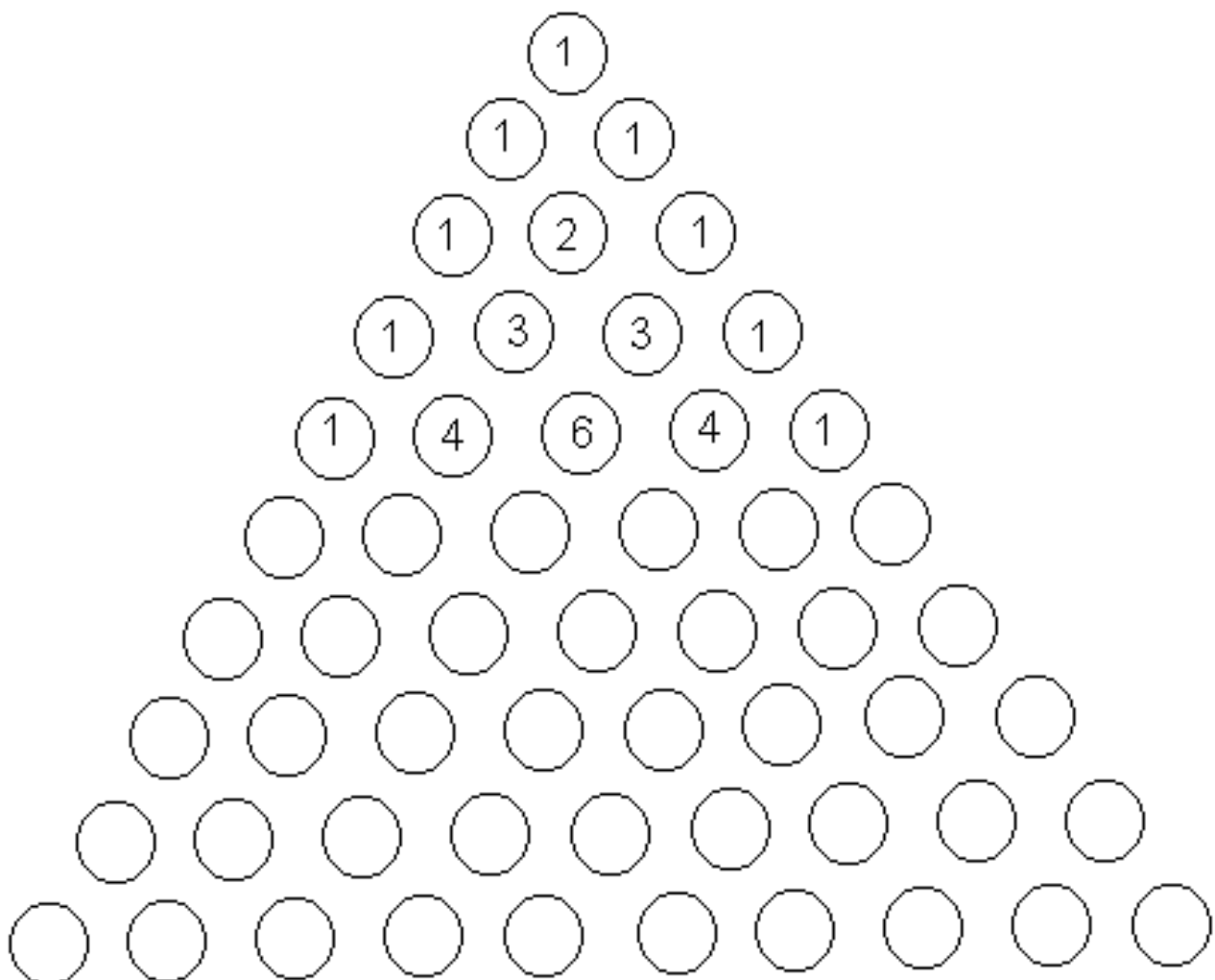
This picture shows the first five lines of Pascal's triangle. Can you work out how it is made?

①
① ①
① ② ①
① ③ ③ ①
① ④ ⑥ ④ ①

Each number is the total of the two numbers above it. Work out the next five lines of Pascal's triangle and write them below.

①
① ①
① ② ①
① ③ ③ ①
① ④ ⑥ ④ ①

(○ ○ ○ ○ ○ ○)
(○ ○ ○ ○ ○ ○ ○)
(○ ○ ○ ○ ○ ○ ○ ○)
(○ ○ ○ ○ ○ ○ ○ ○ ○)
(○ ○ ○ ○ ○ ○ ○ ○ ○ ○)

- Look at your diagram. What patterns can you see?
- Look at the odd numbers. How are they arranged in the triangle?
- Now, look at the even numbers. How are they arranged in the triangle?
- Look at the diagonal lines on the triangle. What patterns do you notice?
- Is there a way of predicting the next line of the triangle, without having to work out each number by adding the two numbers above it?
- Investigate the totals of the numbers in each horizontal row. Is there a pattern? Can you predict the next total?