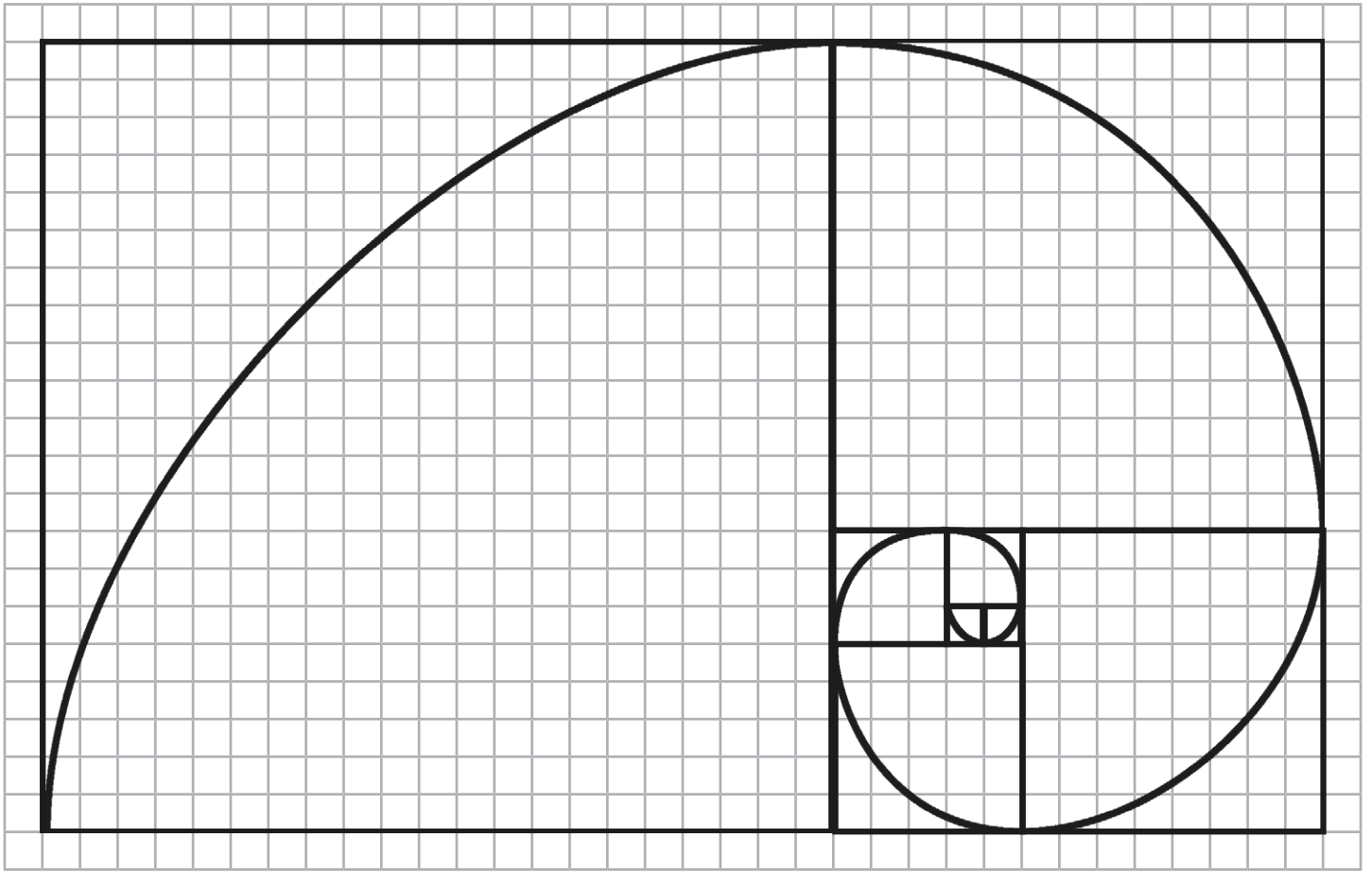


It's a Beautiful Maths World, Mr Fibonacci!



The image above shows a spiral which relates to the work of Leonardo Fibonacci. Fibonacci was a mathematician in Italy during the Middle Ages. This spiral is also known as the 'Golden Ratio'.

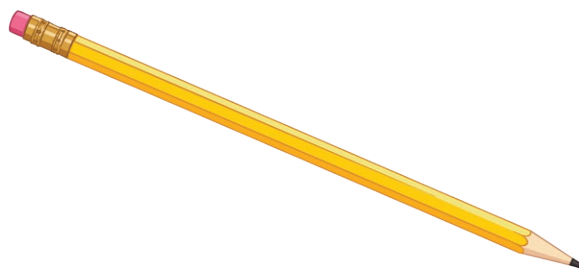
To discover the sequence, you can count the units along an edge of each of the squares, starting at the innermost square.



Questions

1. Use the spiral to help you complete the sequence:

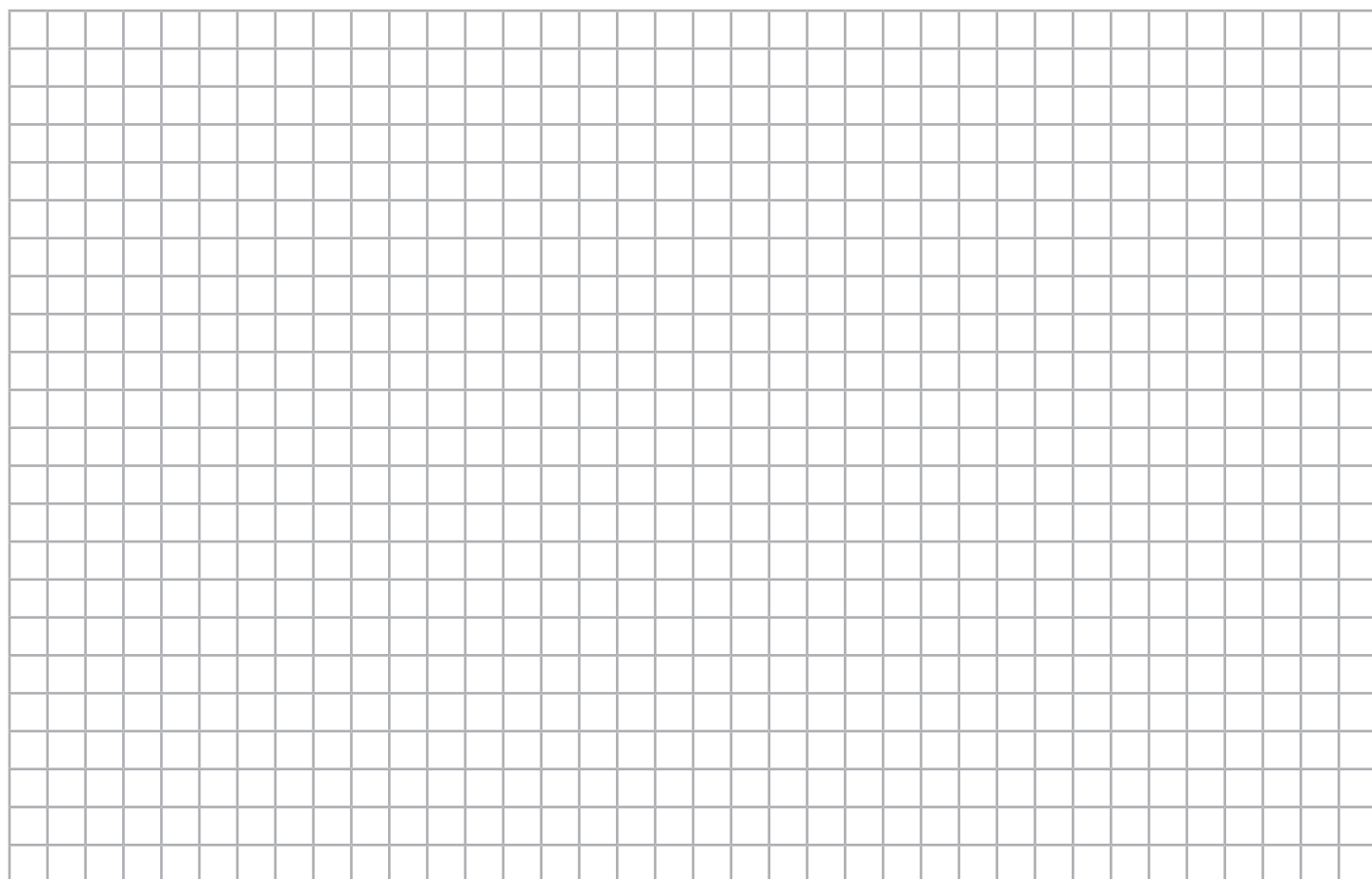
1, , 2, , , 8, , 21



2. Explain how you think the sequence is formed.

3. What is the next number in the sequence after 21?

4. Have a go at reproducing the spiral on the graph paper below.

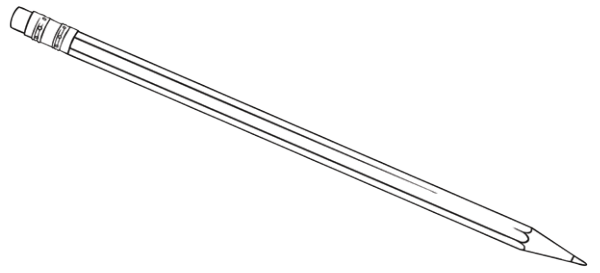


Answers

Questions

1. Use the spiral to help you complete the sequence:

1, 1, 2, 3, 5, 8, 13, 21



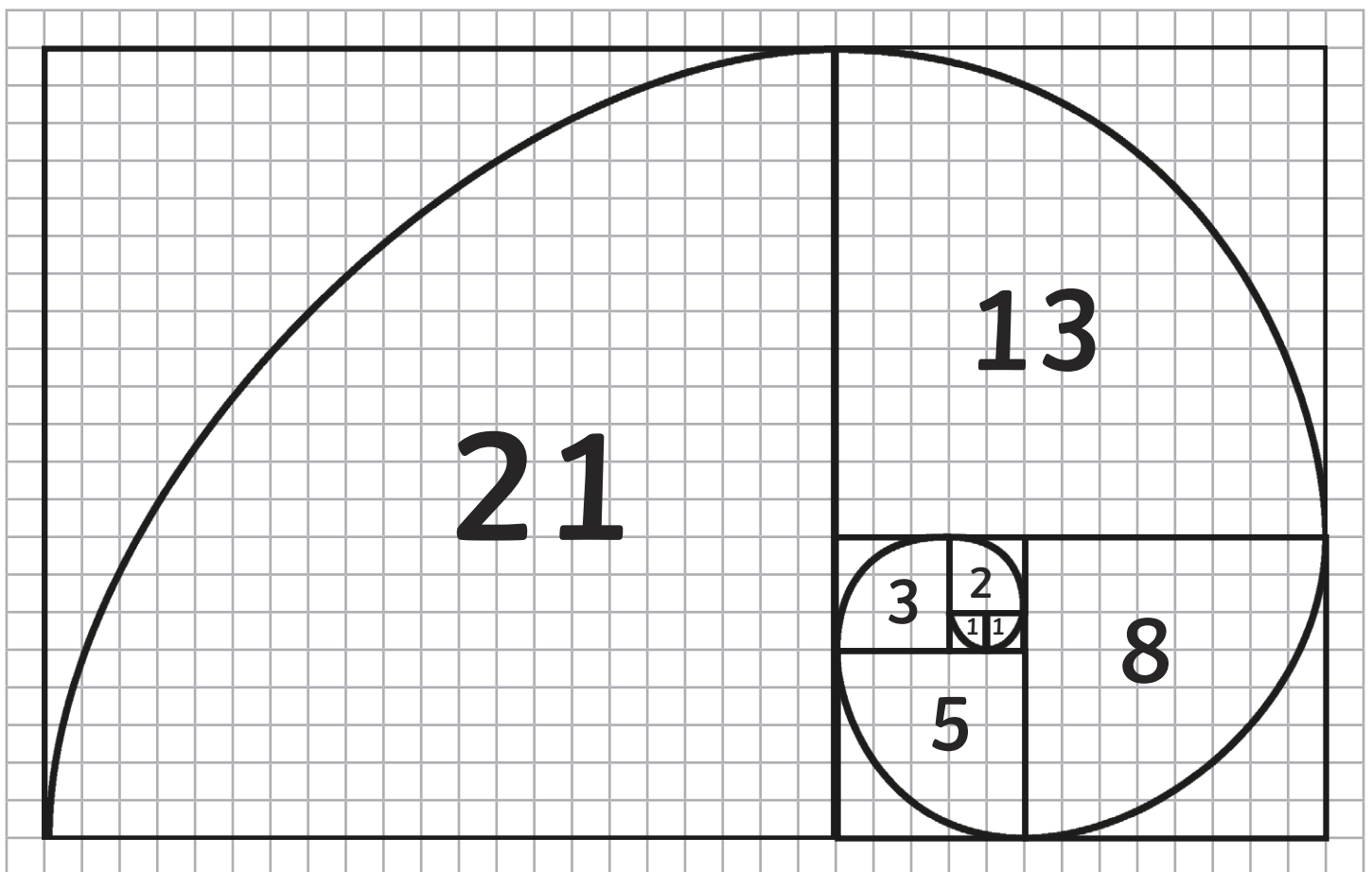
2. Explain how you think the sequence is formed.

Each number is the sum of the previous two numbers in the sequence, e.g. $1 + 1 = 2$.

3. What is the next number in the sequence after 21?

$$13 + 21 = 34$$

4. Have a go at reproducing the spiral on the graph paper below.



Extension

The numbers in the 1, 1, 2, 3, 5, 8, 13, 21... sequence are known as the 'Fibonacci numbers'. Fibonacci did not actually discover these numbers; they were described many years earlier in Indian mathematics. However, Fibonacci applied the numbers in his famous book 'Liber Abaci' and so the sequence was named after him.

Examples of the sequence can be found in nature, such as in the spirals of seashells.

See if you can find further examples of spirals in nature. You may like to take a camera or sketchpad with you to record your findings.

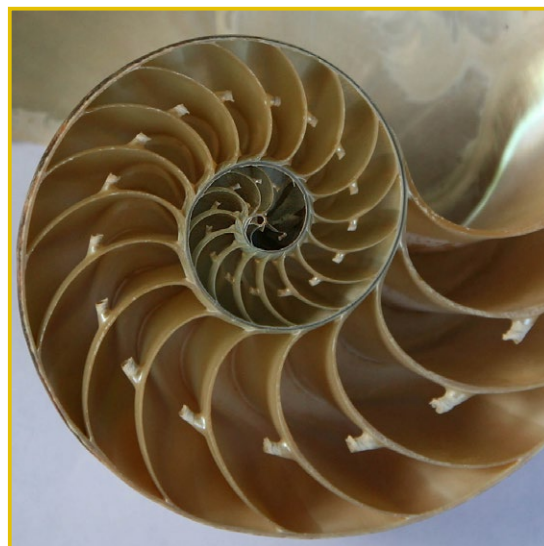


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One Step Further

Along with this, record any sequences you spot in addition to natural spirals. These could be patterns of bricks on buildings, staircases or any manmade objects. Take a photograph or sketch of them and see if you can work out what the numerical sequence is (if there is one).



Sketches

