



Name:

Date:

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**Instruction:** What number comes next in each of the following patterns?

1.
2.
3.
4.
5. 1, 1, 2, 3, 5, 8, ()... This is called the Fibonacci sequence. You get the next term by adding the first two terms. So  $1 + 1 = 2$ ,  $1 + 2 = 3$ ,  $2 + 3 = 5$ , ...
6. 0, 1, 2, 3, 6, 11, 20, ()... We get the next number in this pattern by adding the previous three numbers. So  $0 + 1 + 2 = 3$ ,  $1 + 2 + 3 = 6$ ,  $2 + 3 + 6 = 11$ , ...
7.
8.
9.
10. We follow the hint and try the experiment with 12 and 20. We notice that with 12 lockers, lockers 1, 4, and 9 are left open. We notice that with 20 lockers, lockers 1, 4, 9, and 16 are left open. So the open lockers are square numbers (a square number is a number times itself. So  $1 = 1 \times 1$ ,  $4 = 2 \times 2$ ,  $9 = 3 \times 3$ ,  $16 = 4 \times 4$ , and so on). So let's find the number of square numbers that are between 1 and 100. There are 10: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100. So there will be  lockers left open.