

# The happy numbers

1, 7, 10, 13, 19, 23, 28, 31, 32, 44, 49,  
68, 70, 79, 82, 86, 91, 94, 97, 100, 103,  
109, 129, 130, 133, 139, 167, 176, 188, ...

Add up the squares of each of the digits of  $n$ .  
If repeatedly doing this eventually reaches 1,  $n$  is happy.

## Example:

$19 \rightarrow 82 \rightarrow 68 \rightarrow 100 \rightarrow 1$ , so 19 is happy.

Numbers which never reach 1 are called *unhappy*.