

Palindromes

Palindromes are words, phrases or numbers that read the same backwards as forwards. Examples of words or phrases that are palindromes:

MUM
RACECAR
DENNIS SINNED
MADAM I'M ADAM
GO HANG A SALAMI I'M A LASAGNA HOG
WAS IT ELIOT'S TOILET I SAW
NEVER ODD OR EVEN
DO GEESE SEE GOD
GLENELG
DAD

Examples of numbers that are palindromes:

121 4554 8760678 55 100001

1. Jacqui had lunch at 12:21. She noticed this was a palindrome. If the time she finished lunch was at the next palindrome, how long was her lunch?
(Use 12 hour time)

2. Floyd also started his lunch at 1221 using 24 hour time. If he finished his lunch at the next time that was a palindrome using the 24 hour time, how long was his lunch?

3. 2002 was the last year that was a palindrome. List the next three years that will be palindromes.

4. The 20th of February 2002 (20-02-2002) was a palindrome. What will be the next two dates that are palindromes?

5. It has been claimed that reversing a number and adding will always lead to a palindromic number.

Examples:

①. $\begin{array}{r} 53 \\ 35 \\ \hline 88 \end{array}$	②. $\begin{array}{r} 2354 \\ 4532 \\ \hline 6886 \end{array}$	③. $\begin{array}{r} 103694 \\ 496301 \\ \hline 599995 \end{array}$
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④. $\begin{array}{r} 874 \\ 478 \\ \hline 1352 \\ 2531 \\ \hline 3883 \end{array}$	⑤. $\begin{array}{r} 987 \\ 789 \\ \hline 1776 \\ 6771 \\ \hline 8547 \\ 7458 \\ \hline 16005 \\ 50061 \\ \hline 66066 \end{array}$
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Notice that sometimes the reversing and adding needs to be repeated several times before a palindrome is formed

It can be seen that examples 1, 2 and 3 only needed 1 step before a palindrome was formed. Example 4 needed 2 steps and example 5 needed 4 steps.

On a separate sheet of paper find out the number of steps needed to form palindromes from the following numbers.

Number	38	439	837	79
Number of Steps				

Find four numbers that require at least three steps before a palindrome is formed.

Number				
Number of Steps				

For a real challenge find the number of steps needed to form a palindrome from the number 89.

(It is more than 20 steps!)