

Powers of...

-- 1^1 last digit = 1

-- 1^2 "

-- 1^3 "

-- 1^4 "

-- 1^{995822} "

Checking
Last digit of
powers of numbers
ending with
0, 1, 2, ..., 9 in the
last digit.

Powers of 2: last digit

$$\begin{array}{l} 2^1 = 2 \\ 2^2 = 4 \\ 2^3 = 8 \\ 2^4 = 16 \\ 2^5 = 32 \end{array} \left. \vphantom{\begin{array}{l} 2^1 \\ 2^2 \\ 2^3 \\ 2^4 \\ 2^5 \end{array}} \right\} 4$$

$$79 \div 4 = 19 \text{ remainder } 3$$

...

$$3432 \wedge 79 = \dots 8$$

$$82$$

$$\times 2$$

$$\hline \dots 4$$

$$\times 2$$

$$\hline \dots 8$$

$$\times 2$$

$$\hline \dots 6$$

last digit

3:

$$\dots 3^1 =$$

3

$$\dots 3^2 =$$

9

$$\dots 3^3 = \dots 7$$

$$\dots 3^4 = \dots 1$$

4

$$\dots 3^5 = \dots 3$$

$$\dots 3^7 = \dots 9$$

$$79 \div 4 = 3$$

4: last digit

$$\begin{array}{l} \dots 4^1 = \dots 4 \\ \dots 4^2 = \dots 6 \end{array} \} 2$$

$$\dots 4^3 = \dots 4$$

$$\dots 4^4 = \dots 6$$

...

$$4^{221} = \dots 4$$

$$221 : 2 = 1$$

5: last digit

$$--5^1 1 = 5 \rightarrow 1$$

$$---5^1 2 = \dots 5$$

$$--5^1 220 = \dots 5 \quad 220 \% 5 = 0$$

$\cdot 1.4$ also works

6: last digit

$$- - 6^1 1 = 6 \rightarrow 1$$

$$- - 6^1 2 = \dots 6$$

$$- - 6^1 1122 = \dots 6$$

$$1122 \div 1 = 0$$

$\div 4$ also works

7: last digit

$$\begin{array}{l} \dots 7^1 = 7 \\ \dots 7^2 = \dots 9 \\ \dots 7^3 = \dots 3 \\ \dots 7^4 = \dots 1 \\ \dots 7^5 = \dots 7 \end{array} \left. \vphantom{\begin{array}{l} \dots 7^1 = 7 \\ \dots 7^2 = \dots 9 \\ \dots 7^3 = \dots 3 \\ \dots 7^4 = \dots 1 \\ \dots 7^5 = \dots 7 \end{array}} \right\} 4$$

$$7^{83} = \dots 3$$

$$83 \div 4 = 3$$

\therefore 4 works.

8: last digit

$$\dots 8^1 = 8$$

$$\dots 8^2 = \dots 4$$

$$\dots 8^3 = \dots 2$$

$$\dots 8^4 = \dots 6$$

$$\dots 8^5 = \dots 8$$

} 4

$$8^{100} = \dots 6$$

$$100 \% 4 = 0$$

-1-4 works for
powers of 8

9: last digit

$$\begin{array}{l} \dots 9^1 = 9 \\ \dots 9^2 = \dots 1 \\ \dots 9^3 = \dots 9 \end{array} \Bigg\}^2$$

$$9^1 \mid 1 = \dots 9 \quad \mid 1 \div 2 = 1$$

-1-4 works for
9 also.

0: last digit

$$0^1 = 0 \rightarrow 1$$

$$0^2 = 0$$

$$0^{99} = 0$$

-/- works if 0 also,