

Units Digits

Ex: Find the units digit of $24^{100} \Rightarrow 6$

Find the units digit of $24^1 \Rightarrow 4$

Find the units digit of $24^2 = 576$

$$4^2 = 16 \Rightarrow 6$$

... of 24^3

$$4^3 = 64 \Rightarrow 4$$

$$24^4 \rightarrow 24^3 \cdot 24$$

$$4 \cdot 4 \rightarrow 6$$

$$\begin{array}{r} 24 \\ \cdot 24 \\ \hline 96 \\ + 480 \\ \hline 576 \end{array}$$

$$24^1 \rightarrow 4$$

$$24^2 \rightarrow 6$$

$$24^3 \rightarrow 4$$

$$24^4 \rightarrow 6$$

$$24^5 \rightarrow 4$$

$$24^6 \rightarrow 6$$

$$24^7 \rightarrow 4$$

Ex: What's the units digit of $(3^3)^5$?

$$(3^3)^5 = 3^{3 \cdot 5} = 3^{15}$$

$$\begin{array}{r} 3R3 \\ 4\sqrt{15} \end{array}$$

$$3^1 = 3 \rightarrow 3$$

$$3^2 = 9 \rightarrow 9$$

$$3^3 = 27 \rightarrow 7$$

$$3^4 = 81 \rightarrow 1$$

$$3^5 = 243 \rightarrow 3$$

$$3^6 = 729 \rightarrow 9$$

$$3^7 = 2187 \rightarrow 7$$

$$3^8 = 6561 \rightarrow 1$$

$$3^9 = 19683 \rightarrow 3$$