

Divisibility Rules

Divisibility by 5: does it end in 0 or 5?

$$10a + 5$$

Div. by 2: is the units digit even?

$$10a + b$$

Div. by 3: $2049 = 2 \cdot 10^3 + 0 \cdot 10^2 + 4 \cdot 10^1 + 9$
 $2 + 0 + 4 + 9 = 15$

$$\equiv 2 \cdot 1^3 + 0 \cdot 1^2 + 4 \cdot 1^1 + 9$$
$$\equiv 2 + 0 + 4 + 9 \pmod{3}$$

Div. by 9: $2049 = 2 \cdot 10^3 + 0 \cdot 10^2 + 4 \cdot 10^1 + 9$
 $2 + 0 + 4 + 9 = 15$

$$\equiv 2 \cdot 1^3 + 0 \cdot 1^2 + 4 \cdot 1^1 + 9$$
$$\equiv 2 + 0 + 4 + 9 \pmod{9}$$

$$81 = 27 \cdot 3$$

$$8 + 1$$

Div. by 4 $2049 = 20 \cdot 100 + 49$

Div. by 2^n last n digits divisible by 2^n

Div. by 25 last 2 digits divisible by 25
 5^n last n digits divisible by 5^n