Rules of Divisibility

Divisible by:	Test	Example
2	Last digit is even (=0, 2, 4, 6, or 8)	3,489,076: Last digit = 6 (even) $6 = 3 \times \mathbf{2}$
3	1. The sum of the digits of the number is divisible by 3 2. Can repeat until sum is 2-digit number that is/not recognizably divisible by 3	16,499,205,854,376: $1 + 6 + 4 + 9 + 9 + 2 + 0 + 5$ $+8 + 5 + 4 + 3 + 7 + 6 = 69$ $6 + 9 = 15$ $15 = 5 \times \mathbf{3}$
4	1. Last 2 digits are divisible by 4 2. Tens digit is even and the ones digit = 0, 4, or 8 3. Tens digit is odd and the ones digit = 2 or 6	358,912: 1. Last 2 digits = 12 $12 = 3 \times \mathbf{4}$ 2. Tens digit = 1, odd & ones digit = **2**
5	Last digit is 5 or 0	3,783,953,495: Last digit = **5**
6	Divisible by 2 (even) and 3	57,342 Last digit = **2** (even) and $5 + 7 + 3 + 4 + 2 = 21$, divisible by **3**
7	Double the last digit, then subtract the result from the rest of the digits. Repeat for larger numbers until result is a 2-digit number; 2-digit number is divisible by 7	357: $2 \times \mathbf{7} = 14$ (double the last digit) $35 - 14 = 21$ (subtract) $21 = 3 \times \mathbf{7}$
8	1. Hundreds digit even: last 2 digits divisible by 8 2. Hundreds digit odd: add 4 to the last 2 digits and sum is divisible by 8 3. Last 3 digits divisible by 8	986,104: 1. Hundreds digit = 1, odd $04 + 4 = \mathbf{8}$ 2. Last 3 digits = 104 $104 = 13 \times \mathbf{8}$
9	The sum of the digits of the number is divisible by 9	24,343,785: $2 + 4 + 3 + 4 + 3 + 7 + 8 + 5 = 36$ $36 = 4 \times \mathbf{9}$
10	Last digit is 0	34,789,013,467,593,487,540: Last digit = **0**
11	1. Alternately subtract, then add the digits from L to R; the sum is divisible by 11 2. Subtract the last digit from the rest	918,082: 1. $9 - 1 + 8 - 0 + 8 - 2 = 22$ $22 = 2 \times \mathbf{11}$ 627: 2. $62 - 7 = 55$ $55 = 5 \times \mathbf{11}$

Divisible by:	Test	Example

12	Divisible by 3 and 4	324: $3 + 2 + 4 = 9$, divisible by **3** and Last 2 digits $= 24$, divisible by **4**
13	Add 4 times the last digit to the rest of the digits. Repeat until sum is/not recognizably divisible by 13	637: $63 + (7 \times 4) = 91$ $9 + (1 \times 4) =$ **13**
14	Divisible by 2 and 7	182: Last digit $= 2$ (even), divisible by 2 and $2 \times 2 = 4$ (double the last digit) $18 - 4 = 14$, divisible by 7
15	Divisible by 3 and 5	345: $3 + 4 + 5 = 12$, divisible by 3 and Last digit $= 5$, divisible by 5
16	1. Thousands place even: take the last 3 digits 2. Thousands place odd: add 8 to the last 3 digits 3. With the 3-digit number: multiply hundreds digit by 4, then add the last 2 digits	254,176: Thousands digit $= 4$, so 176 $(1 \times 4) + 76 = 80$ $80 = 5 \times$ **16** 693,408: Thousands digit $= 3$, so $408 + 8 = 416$ $(4 \times 4) + 16 = 32$ $32 = 2 \times$ **16**
17	Subtract 5 times the last digit from the rest	221: $22 - (1 \times 5) =$ **17**
18	Divisible by 2 and 9	35,406: Last digit $= 2$ (even), divisible by 2 and $3 + 5 + 4 + 0 + 6 = 18$, divisible by 9
19	Add twice the last digit to the rest	437: $43 + (7 \times 2) = 57$ $5 + (7 \times 2) =$ **19**
20	Divisible by 10 and the tens digit is even	360: Last digit $=$ **0** and tens digit $= 6$ is even
25	Last 2 digits are 25, 50, or 75	895,438,675: Last 2 digits $=$ **75** 7,325: Last 2 digits $=$ **25**
50	Last 2 digits are 50 or 00	686,352,400: Last 2 digits $=$ **00** 327,950: Last 2 digits $=$ **50**