

THE ULTIMATE COLLECTION OF EVERY KNOWN TESTS OF DIVISIBILITY

After the most successful and very useful article on [THE ULTIMATE GUIDE TO NUMBER CLASSIFICATION](#), [LazyMaths.com](#) is pleased to offer another path breaking article - THE ULTIMATE COLLECTION OF EVERY KNOWN TESTS OF DIVISIBILITY.

As a part of any speed math exam like GMAT, GRE or CAT, if you are trying to find out whether that number is evenly divisible without actually dividing it, then use these tests of divisibility. Learn these tests and save yourself precious time.

Divisor	Divisibility condition	Examples
1	Automatic	Every number is divisible by 1
2	The last digit is even (0,2,4,6 or 8)	1294: 4 is even
3	The sum of digits is divisible by 3.	405: $4 + 0 + 5 = 9$, which clearly is divisible by 3.
4	The number formed by the last two digits is divisible by 4.	40832: 32 is divisible by 4.
5	The last digit is 0 or 5.	490: the last digit is 0.
6	It is divisible by 2 and 3.	1,458: $1 + 4 + 5 + 8 = 18$, $1 + 8 = 9$, so it is divisible by 3 and the last digit is even, hence number is divisible 6.
7	If you double the last digit and subtract it from the rest of the number and the answer is divisible by 7.	483: $48 - (3 \times 2) = 42 = 7 \times 6$.
8	The number formed by the last three digits is divisible by 8.	56: $(5 \times 2) + 6 = 16$.
9	The sum of digits is divisible by 9.	2,880: $2 + 8 + 8 + 0 = 18$; $1 + 8 = 9$.
10	The number ends in 0.	130: the last digit is 0.
11	If you sum every second digit, and subtract all the other digits, the answer is divisible by 11.	918,082: $9 - 1 + 8 - 0 + 8 - 2 = 22$.
12	The number is divisible by 3 and 4.	324: $(32 \times 2) - 4 = 60$.
13	Add 4 times the last digit to the rest, the answer is divisible by 13.	637: $63 + (7 \times 4) = 91$, $9 + (1 \times 4) = 13$.
14	It is divisible by 2 and 7	224: it is divisible by 2 and by 7.
15	It is divisible by 3 and 5	390: it is divisible by 3 and by 5.
16	Sum the number with last two digits removed, times 4, plus the last two digits.	176: $(1 \times 4) + 76 = 80$.

17	Subtract 5 times the last digit from the rest, the answer is divisible by 17.	221: $22 - (1 \times 5) = 17$.
18	It is divisible by 2 and 9.	342: it is divisible by 2 and by 9.
19	Add twice the last digit to the rest, the answer is divisible by 19.	437: $43 + (7 \times 2) = 57$.
20	The number formed by the last 2 digits is divisible by 20.	480: 80 is divisible by 20.
21	Subtract twice the last digit from the rest.	168: $16 - (8 \times 2) = 0$, 168 is divisible. 1050: $105 - (0 \times 2) = 105$, $10 - (5 \times 2) = 0$, 1050 is divisible.
23	Add 7 times the last digit to the rest.	
25	The number formed by the last two digits is divisible by 25.	134,250: 50 is divisible by 25.
27	Since $37 \times 27 = 999$; the multiplier is one, taking three digits at-a-time. Sum the digits in blocks of three from right to left.	2,644,272: $2 + 644 + 272 = 918$.
	Subtract 8 times the last digit from the rest.	621: $62 - (1 \times 8) = 54$.
29	Add three times the last digit to the rest.	261: $1 \times 3 = 3$; $3 + 26 = 29$
31	Subtract three times the last digit from the rest.	
32	The number formed by the last five digits is divisible by 32, as follows:	
	If the ten thousands digit is even, examine the number formed by the last four digits.	41,312: 1312.
	If the ten thousands digit is odd, examine the number formed by the last four digits plus 16.	254,176: $4176 + 16 = 4192$.
	Add the last two digits to 4 times the rest.	1,312: $(13 \times 4) + 12 = 64$.
33	Add 10 times the last digit to the rest.	627: $62 + 7 \times 10 = 132$, $13 + 2 \times 10 = 33$.
37	Sum the digits in blocks of three from right to left. Since $37 \times 27 = 999$; round up to 1000; drop the three zeros; the multiplier is one, taking three digits at-a-time. Add these products, going from right to left. If the result is divisible by 37, then the number is divisible by 37.	2,651,272: $2 + 651 + 272 = 925$. $925 / 37 = 25$, yes, divisible.
	Subtract 11 times the last digit from the rest.	925: $92 - (5 \times 11) = 37$.
39	Add 4 times the last digit to the rest.	351: $1 \times 4 = 4$; $4 + 35 = 39$
41	Subtract 4 times the last digit from the rest.	738: $73 - 8 \times 4 = 41$.
43	Add 13 times the last digit to the rest.	36,249: $3624 + 9 \times 13 = 3741$, $374 + 1 \times 13 = 387$, $38 + 7 \times 13 = 129$, $12 + 9 \times 13 = 129 = 43 \times 3$.

47	Subtract 14 times the last digit from the rest.	1,642,979: $164297 - 9 \times 14 = 164171$, $16417 - 14 = 16403$, $1640 - 3 \times 14 = 1598$, $159 - 8 \times 14 = 47$.
49	Add 5 times the last digit to the rest.	1,127: $112 + (7 \times 5) = 147$. 147: $14 + (7 \times 5) = 49$ Yes, divisible.
51	Subtract 5 times the last digit to the rest.	
59	Add 6 times the last digit to the rest.	295: $5 \times 6 = 30$; $30 + 29 = 59$
61	Subtract 6 times the last digit from the rest.	
69	Add 7 times the last digit to the rest.	345: $5 \times 7 = 35$; $35 + 34 = 69$
71	Subtract 7 times the last digit from the rest.	
79	Add 8 times the last digit to the rest.	711: $1 \times 8 = 8$; $8 + 71 = 79$
81	Subtract 8 times the last digit from the rest.	
89	Add 9 times the last digit to the rest.	801: $1 \times 9 = 9$; $80 + 9 = 89$
91	Subtract 9 times the last digit from the rest.	
989	Divide the number of thousands by 989. Multiply the remainder by 11 and add to last 3 digits.	21758: $21 / 989$ Remainder = 21, $21 \times 11 = 231$; $758 + 231 = 989$

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