

Divisibility Rules You Never Learned in School

| Divisible by: | If: |
|---------------|--|
| 2 | The last digit is 0, 2, 4, 6, or 8. |
| 3 | The sum of its digits is divisible by 3. Example: 534: $5+3+4=12$ and $1+2=3$ |
| 4 | The last two digits are divisible by 4. |
| 5 | The last digit is a 0 or 5. |
| 6 | The number is divisible by both 2 and 3. |
| 7 | Double the last digit and subtract it from the remaining leading truncated number. If the result is divisible by 7, then so is the original number. Example: 826: Twice 6 is 12. $82-12=70$, which is divisible by 7. |
| 8 | The last three digits are divisible by 8. |
| 9 | The sum of its digits is divisible by 9. Example: 9,774: $9+7+7+4=27$ and $2+7=9$. |
| 10 | The last digit is a 0. |
| 11 | Subtract the last digit from the remaining leading truncated number. If the result is divisible by 11, then so is the first number. Example: 19,151: $1,915-1=1914 \rightarrow 191-4=187 \rightarrow 18-7=11$, so 19,151 is divisible by 11. |
| 12 | The number is divisible by both 3 and 4. |

- 13 Add 4 times the last digit to the remaining leading truncated number. If the result is divisible by 13, then so was the first number.
Example: 50,661: $5,066+1(4)=5,070 \rightarrow 507+0(4)=507 \rightarrow 50+7(4)=78 \rightarrow 7+8(4)=39$ which is $3 \cdot 13$, so 50,661 is divisible by 13.
- 17 Subtract 5 times the last digit from the remaining leading truncated number. If the result is divisible by 17, then so is the first number.
Example: 85,136: $8,513-6(5)=8,483 \rightarrow 848-3(5)=833 \rightarrow 83-3(5)=68$ which is $4 \cdot 17$, so 85,136 is divisible by 17.
- 23 Add 7 times the last digit to the remaining leading truncated number. If the result is divisible by 23, then so was the first number.
Example: 17,043: $1,074+3(7)=1,725 \rightarrow 172+5(7)=207 \rightarrow 20+7(7)=69$ which is $3 \cdot 23$.
- 29 Add 3 times the last digit to the remaining leading truncated number. If the result is divisible by 29, then so was the first number.
- 31 Subtract 3 times the last digit from the remaining leading truncated number. If the result is divisible by 31, then so was the first number.
- 37 Subtract 11 times the last digit from the remaining leading truncated number. If the result is divisible by 37, then so was the first number.
- 41 Subtract 4 times the last digit from the remaining leading truncated number. If the result is divisible by 41, then so was the first number.
- 43 Add 13 times the last digit to the remaining leading truncated number. If the result is divisible by 43, then so was the original number.
- 47 Subtract 14 times the last digit from the remaining leading truncated number. If the result is divisible by 47, then so was the original number.