# Divisibility Rules

Ways to determine if one number can evenly be divided by another, without actually dividing them.

| Number | Rule | Example | Divisible? |
|---|---|---|---|
| **2** | The last digit is even: (0,2,4,6,8). | 5 7 **6** is even | **YES** |
| | | 8 3 **1** is not even | **NO** |
| **3** | The sum of the digits is divisible by 3. | **5 3 7** --- 5+3+7 = 15, 15 ÷ 3 = 5 | **YES** |
| | | **8 3 3** --- 8+3+3 = 14, 14 ÷ 3 has a remainder | **NO** |
| **4** | Double the tens digit and add to the ones digit. This answer is divisible by 4. | 2 5 **7 6** --- 2 x 7 + 6 = 20, 20 ÷ 4 = 5 | **YES** |
| | | 2 5 **2 5** --- 2 x 2 + 5 = 9, 9 ÷ 4 has a remainder | **NO** |
| **5** | The last digit is 0 or 5. | 3 8 **5** last digit is 5 | **YES** |
| | | 9 6 **4** last digit is 4 | **NO** |
| **6** | The number is divisible by both 2 and 3. | **4 3 2** --- even; 4+3+2 = 9 and 9 ÷ 3 = 3 | **YES** |
| | | **5 2 4** --- even; 5+2+4 = 11 and 11 ÷ 3 has a remainder | **NO** |
| **7** | Double the last digit and subtract it from the rest of the number. This answer is 0 or divisible by 7. * You can apply this rule to that answer again. | **5 8 1** --- 2 x 1 = 2, 58 - 2 = 56 and 56 ÷ 7 = 8 | **YES** |
| | | **3 2 1** --- 2 x 1 = 2 32 - 2 = 30 and 30 ÷ 7 has a remainder | **NO** |

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| **8** | The last three digits are divisible by 8. | 4 5 **1 4 4**<br>144 ÷ 8 = 18 | **YES** |
| | | 3 2 **2 4 5**<br>245 ÷ 8 has a remainder | **NO** |
| **9** | The sum of the digits is divisible by 9. | **4 8 5 1** --- 4+8+5+1 = 18<br>18 ÷ 9 = 2 | **YES** |
| | | **2 6 1 3** --- 2+6+1+3 = 12<br>12 ÷ 9 has a remainder | **NO** |
| **10** | The last digit is 0. | 3 4 7 **0** --- last digit is 0 | **YES** |
| | | 8 3 2 **5** --- last digit is 5 | **NO** |
| **11** | Alternate subtracting and adding the digits from left to right.<br>This answer is 0 or divisible by 11. | **9 5 1 1 7**<br>9-5+1-1+7 = 11<br>11 ÷ 11 = 1 | **YES** |
| | | **9 3 8 2**<br>9-3+8-2 = 12<br>12 ÷ 11 has a remainder | **NO** |
| **12** | The number is divisible by both 3 and 4. | **8 3 5 2** --- 8+3+5+2 = 18,<br>18 ÷ 3 = 6 and<br>2 x 5 + 2 = 12, 12 ÷ 4 = 3 | **YES** |
| | | **7 8 1 6** --- 7+8+1+6 = 22<br>22 ÷ 3 has a remainder<br>and 2 x 1 + 6 = 8,<br>**8** ÷ 4 = 2 | **NO** |

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