Divisibility and Remainder Shortcuts

NJ Loves Math

Divisibility and Remainder Shortcuts

Understanding the rules for divisibility and remainders improves speed and accuracy for reducing common fractions, identifying factors and more. Rules are specific to the divisor.

Divisor	Divisibility Rule	Remainder Rule
2	The number is even.	If the units digit is even, the remainder is 0, if odd, its 1.
3	The sum of the digits is divisible by 3.	The result from summing the digits and dividing by 3.
4	The last two digits is divisible by 4.	Use the remainder from the divisibility rule.
5	The number ends in 0 or 5.	If the last digit is < 5, then it is the remainder, if > 5, then divide 5 into it to get the remainder.
6	The number is even and the sum of the digits is divisible by 3.	The result from summing the digits and dividing by 6.
8	The last three digits are divisible by 8.	Use the remainder from the divisibility rule.
9	The sum of the digits is divisible by 9.	The result from summing the digits and dividing by 9.
10	The number ends in 0.	Use the units digit.
11	Add the digits at odd places. Subtract the sum of the digits at even places. If the difference is 0, then it is divisible by 11.	Use the remainder from the divisibility rule. If the remainder is negative, keep adding 11 to it until you reach a positive number. That is the remainder.

Note: If you don't know the new number's divisibility, you can use the rule again and again and again.

Divisibility Shortcuts

Knowing the rules for divisibility and finding remainders can improve speed and accuracy for reducing common fractions and identifying factors. Each rule is specific to the divisor. A number is divisible by another number if after division, the remainder is zero.

Divisible By?	Divisibility Rule
2	The number is even (it ends with 0, 2, 4, 6, or 8.)
3	The sum of the digits is divisible by 3.
4	The last two digits is divisible by 4.
5	The number ends in 0 or 5.
6	The number is even and the sum of the digits is divisible by 3.
8	The last three digits are divisible by 8.
9	The sum of the digits is divisible by 9.
10	The number ends in 0.
11	Add the digits at odd places. Subtract the sum of the digits at even places. If the difference is 0, then the number is divisible by 11.

Remainder Shortcuts

Knowing the rules for divisibility and finding remainders can improve speed and accuracy for reducing common fractions and identifying factors. Each rule is specific to the divisor. A number is divisible by another number if after division, the remainder is zero.

Divisible By?	Divisibility Rule
2	If the units digit is even, the remainder is 0, if odd, its 1.
3	The result from summing the digits and dividing by 3.
4	Use the remainder from the divisibility rule.
5	If the last digit is less than 5, then it is the remainder, if greater than 5, then divide (or subtract) 5 into it to get the remainder.
6	The result from summing the digits and dividing by 6.
8	Use the remainder from the divisibility rule.
9	The result from summing the digits and dividing by 9.
10	Use the units digit.
11	Use the remainder from the divisibility rule. If the remainder isnegative, keep adding 11 to the remainder until you get to a positive number.

Further References

http://www.helpingwithmath.com/by_subject/division/div_divisibility_rules.htm

http://burningmath.blogspot.com/2013/09/finding-remainder-on-dividing-numbers.html

https://brilliant.org/wiki/divisibility-rules/

The Remainders Game (maths.org)

(Questionable rules that do not work consistently, possibly remove.)

Thank You!

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More Divisibility and Remainder Shortcuts

Divisor	*Divisibility Rule*	*Remainder Rule*
7	Double the unit digit and subtract it from remaining number.	Split the digits of the number in group of 3 starting from unit's place. Add the alternate group and then find their difference. Divide the difference by 7 and get the remainder.
12	A number is divisible by 12 if it is divisible by both 3 and 4.	
13	if 4 times the units digit of the number plus the remaining number is a multiple of 13;	Split the digits of the number in groups of 3 starting from unit's place. Add the alternate group and then find their difference. Divide the difference by 13 and get the remainder.
14	The number must be divisible by 2 and 7.	
15	The number must be divisible by 3 and 5.	
16	The number formed by last four digits in given number must be divisible by 16.	
17	Multiply last digit with 5 and subtract it from remaining number in given number, result must be divisible by 17.	