

Strategies for Reducing Fractions

There are many ways to approach reducing fractions.

Division by 2

Any number that ends in an even number – 0, 2, 4, 6, or 8 (multiples of 2) are evenly divisible by 2.

Division by 3

Add the number's digits. If the sum is evenly divisible by 3, then so is the number.
If needed, you can keep adding the numbers until one digit remains.

For example: 21111

$$2+1+1+1+1=6$$

6 is evenly divisible by 3, so is 21111.

Division by 5

Any number that ends in a 0 or 5 is evenly divisible by 5.

Division by 7

Multiply the last digit by 2, Subtract this answer from the remaining digits. Is this number evenly divisible by 7? If it is, then your original number is evenly divisible by 7.

For example: 252

2, the last digit, multiplied by 2

$$2 \times 2 = 4$$

25, the remaining digits, minus 4

$$25 - 4 = 21$$

21 is evenly divisible by 7, and thus, 252 is as well.

Division by 10

Any number that ends in 0 is evenly divisible by 10.

Division by 11 – four ways for distinct types of numbers:

1. If the sum of every other digit, starting with the first, is equal to the sum of every other digit starting with the second, then the number is evenly divisible by 11.
For example: 13574
 $1 + 5 + 4 = 10$
 $3 + 7 = 10$
So, 13574 is evenly divisible by 11.
2. If all the digits are the same and there is an even number of digits, then the number is evenly divisible by 11.
For example: 444444, which is evenly divisible by 11.

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3. If the number is a 3-digit number with different digits, add the two outside digits. If the difference between the sum and the middle digit is 11, then 11 divided evenly into the 3-digit number. If the sum is the same as the middle digit, then 11 will also divide evenly into the number.
For example: 814
 $8 + 4 = 12$
 $12 - 1 = 11$
So, 814 is evenly divisible by 11.
4. If the digits are different, count them from the right and then add the numbers in the odd positions and the even positions. Subtract the smaller number from the larger. If the difference is evenly divisible by 11, so is the original number.
For example: 181907
 $7 + 9 + 8 = 24$
 $0 + 1 + 1 = 2$
 $24 - 2 = 22$
22 is evenly divisible by 11, so is 181907.
For example: 204314
 $4 + 3 + 0 = 7$
 $1 + 4 + 2 = 7$
 $7 - 7 = 0$
0 is divisible by 11, so is 204314.