Math Tricks for Fractions, Divisibility Rules, and Finding the LCM & GCD

Finding the LCM

Prime Factorization Method

First you factor the numbers into primes and take the highest prime of each number.

Ex. 1) LCM(21,39,15)

1/21+4/39+2/15

21=3*7

39=3*13

15=3*5

Multiply largest primes of each factoring.

7*13*5=1365. There you have the LCM for fractions.

65/1365+140/1365+182/1365=387/1365

Using divisibility rules below it can be simplified.

3+8+7=18, 1+3+6+5=15 so both are divisible by 3

387/3=129, 1365/3=455 so 387/1365 => 129/455

Which cannot be simplified further, after reviewing the rules

below.
Ex. 2) LCM(18,24)
11/18-13/24
$18=2*3^2$
$24=3*2^3$
$3^2*2^3=72$
LCM(18,24) =72.
44/72-39/72 = 5/72

Division Method

My preferred method as it’s faster.

LCM(15,36)
Use divisibility rules below until you can no longer find a value that can go into both to be further divided Then you multiply the values you’ve gotten together.
15/3 = 5, 36/3=12.
As nothing goes into 5 & 12 no further reductions can be made.
So you do 5*12*3=180.
LCM(15,36) =180

Ex 2) LCM(21,39,15)
2+1=3. 3+9=12. 1+5=6.
21/3=7. 39/3=13. 15/3=5.
7*13*5*=1365

Finding the GCD

Division Method

Preferred Method.

You keep going until both numbers can no longer be divided by another value. Taking the largest value that you have that is found in both numbers during the division process.

Ex 1) GCD(18,324)

Using rules below both are divisible by 9.

18/9=2 324/9=36

2/2=1 36/2=18

1*18=18. Both are divisible by 18.

18/18 = 1. 324/18=18.

Final value is 18.

Ex 2) GCD(33,54)

3+3=6. 5+4=9. Thus both are divisible by 3.

33/3=11. 54/3=18

You cannot find any value that can go into both of them and the number is thus 3.

Ex. 3) GCD(44,82)

44/2=22. 82/2=41.

Neither can be reduced further thus the GCD is 2.

Ex. 3) GCD(72,54)

7+2=9. 5+4=9.

72/9=8 54/9=5. There is nothing else that goes into all of these numbers thus the value is 9.

Ex 4) GCD(121,143)

No other ones work so let's try the 11 method.

121=> (1+1) – (2) = 0. 143=> (1+3) -(4) = 0.

As both values are 0 or a multiple of 11 the values are divisible by 11 and it is their GCD.

Euclidean Method

GDC(33,54)

You take the larger number and divide it by the smaller number. Then take the remainder and divide it from the smaller number from previous step. But is probably too slow for use on the TEAS

unless the person is a super-fast divider.
54/33 = 1 remainder 21.
33/21 = 1 remainder 12.
21/12 = 1 remainder 9.
12/9 = 1 remainder 3.
9/3= 3 remainder 0.
Thus the answer is 3.

Divisibility Rules

Here are some rules to make sure that a number is divisible by another number without any remainder.

2) If the last digit is even or is a zero.

Ex. 1) 122. last digit is a 2 which is even thus it is divisible by 2. 122/2=61
Ex. 2) 130. last digit is a zero which means it’s divisible by 2. 130/2=65

3) if you add up all digits and that number is divisible by 3.

Ex. 1) 123. 123=1+2+3=6 and 6/3=2. So it is and it’s 123/3=41.
Ex. 2) 93. 9+3=12. 12/3=4. So it is divisible by 3. 93/3=31.

4) is if the last 2 digits of the number are divisible by 4.

Ex.1) 124. 24/4=6. Thus it is divisible by 4. 124/4=31.
Ex. 2) 736. 32/4=8. Thus it is divisible by 4. 736/4=184.

5) if the number ends in a zero of a five.

Ex. 1) 105. Last digit is a five so it is divisible by 5. 105/5=21.

Ex. 2) 110. Last digit is a zero so it is divisible by 5. 110/5=22

6) if both 2 and 3 rules apply.

Ex. 1) 234. 2+3+4=9 9/3=3. Last digit is a 2 which is even. 234/6=9
Ex. 2) 210. 2+1+0=3. 3/3=1. Last digit is a 0 which also works. 210/6=35

8) is if the last three digits are divisible by 8.

Ex. 1) 1,392. Take last 3 digits, and see if they can be divided by 8 cleanly. 1,392 =>392/8 = 49 so. 1392/8=174
Ex 2) 1,248 Take last 3 digits and see if they can be divided by 8 cleanly. 1248=>248. 248/8=31. 1248/8=156.

9) Same as 3, if all numbers add up and are divisible by 9

Ex. 1)126. 126=>1+2+6=9 9/9 = 1. So 126/9 = 14
Ex. 2) 774. 774=>7+7+4 = 18. 18/9 = 2. So 774/9 = 86

10) If the number ends in a zero.

Ex. 1) 110. 110 =>~~11~~0. 110/10 = 11
Ex. 2) 310. 310=>~~31~~0. 310/10 = 31.

11 Sum each even digit, and odd digits separately. Then calculate the difference between the values. If it is either 0 or a multiple of 11 it is divisible by 11.

Ex. 1) 1441 => (1+4) - (4+1) = 0. Thus it is divisible by 11. 1441/11 = 131.
Ex. 2) 99946 => (9+9+6) - (9+4) = 11. 11 is a multiple of 11 (11^1)