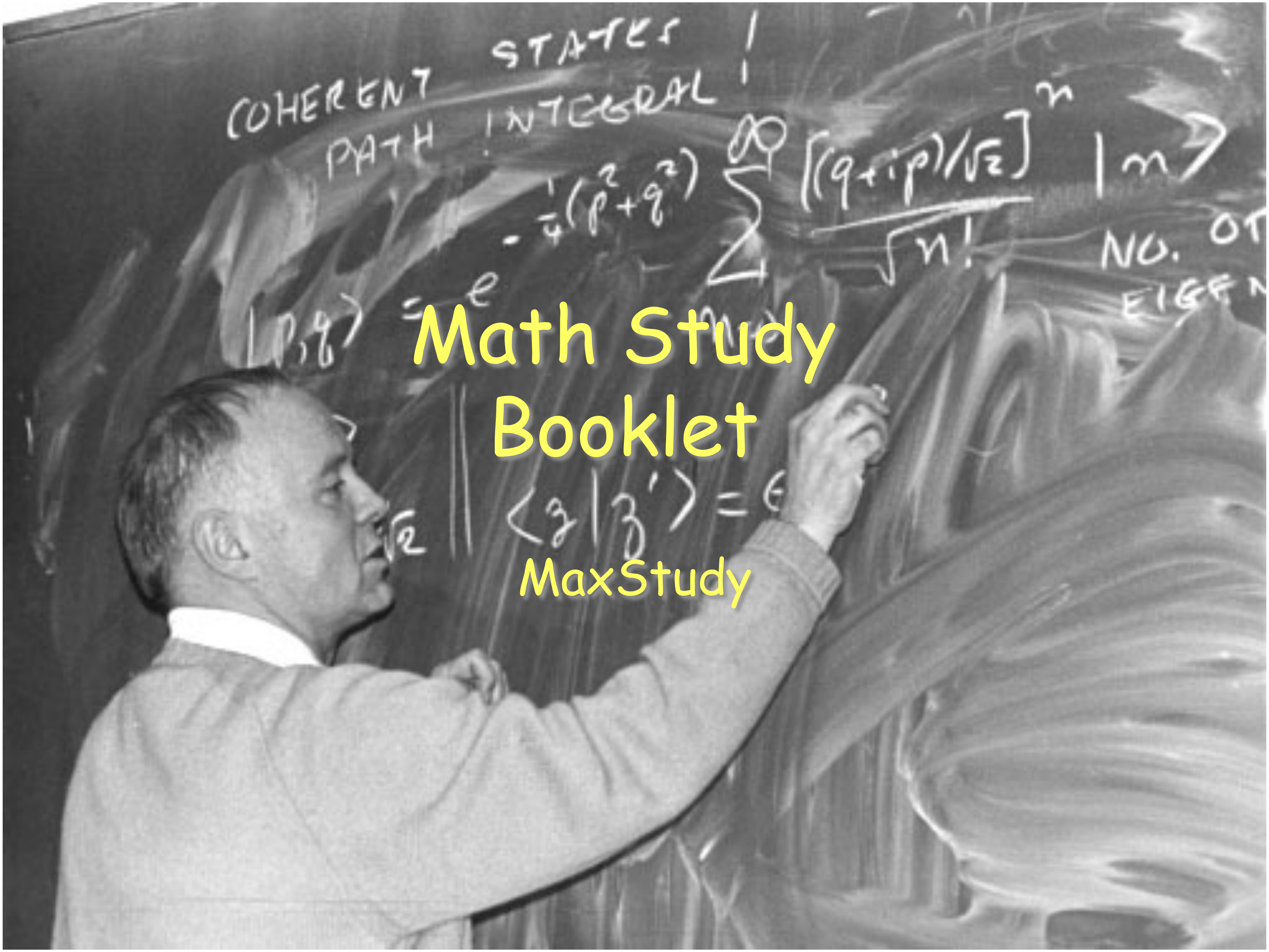


Math Study Booklet

MaxStudy

Topics in this Study Booklet

- Order of Operations
- Prime Factorization (used in GCF AND LCM)
- Greatest Common Factor (GCF)
- Least Common Multiple (LCM)
- Changing Decimals to Fractions (repeating and non-repeating)
- Changing Fractions to Decimals

28/ 4 + 17 (7x5) - 15

- What is used to solve this problem?

- The Order of Operations is used to solve this problem.

Order of Operations

- The Order of Operations is important because it helps you solve any kind of equation.
- The first thing you look for in a problem is parenthesis

28/ 4 + 17 (7x5) - 15

- There are parenthesis so you solve inside the parenthesis first
- 28/ 4 + 17 (7x5) - 15
- 28/ 4 + 17 x 35 - 15
- Seven times five is thirty-five
- Next you look for exponents
- There are no exponents so you move onto the next step

28/ 4 + 17 x 35 - 15

- The next thing you look for is either multiplication or division. It doesn't matter which one you do first.
- 28/ 4 + 17 x 35 - 15
- 7 + 17 x 35 - 15
- Twenty-eight divided by four is seven
- 7 + 17 x 35 - 15
- 7+ 595 - 15
- Seventeen times thirty-five is five-hundred ninety-five

7+ 595 - 15

- The next step is to look for addition or subtraction, like multiplying and dividing it doesn't matter which one you do first.
- 7 + 595 - 15
- Seven plus five-hundred ninety-five is six-hundred two
- 602 - 15
- = 587
- Six-hundred two minus fifteen is five-hundred eighty-seven and is the final answer

TRY THESE!

- Now try some problems on your own!
- 1.) $\frac{45 - 18}{27/\ 3}$

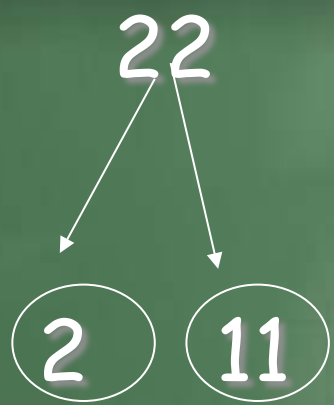
2.) 2 x 7 – 9

3.) 5 [9(2+7) - 5 x 4]

4.) 7 (75 / 5) – 17

5. 30 + 9 (42 / 2)

What is this?



2 x 11

-This is prime factorization, which is used with GCF and LCF and is done by doing factor trees and writing all the factors until you are left with prime numbers. You circle the prime numbers and write them out.

Try These!

Find the Prime Factorization of:
32, 56, 92 (Do a separate factor tree for each number! This is not Greatest Common Factor)

GCF – Greatest Common Factor

- Greatest Common Factor or GCF is the highest factor that is in common with two or more numbers. On the following pages are two ways to solve for the Greatest Common Factor:

GCF - Greatest Common Factor

- Here is one way of finding the Greatest Common Factor, which is listing factors. You list all the factors of each number and circle the ones in common.
- List the factors of 14 and 28
- 14: 1, 2, 4, 7, 14
- 28: 1,2, 4, 7, 14, 28

GCF - Greatest Common Factor

- The common factors of 14 and 28 are:
- 1, 2, 4, 7, and 14 so the Greatest Common Factor is 14 because it it is the highest of all the common factors.

GCF - Greatest Common Factor

- The other method that can be used to solve Greatest Common Factor is by using Prime Factorization and is used more often than listing factors. You do prime factorization by using factor trees.
- We'll use the same factors as before to compare prime factorization to listing factors:
- Use a factor tree to find the common factors of 14 and 28

Greatest Common Factor with Prime Factorization

- 14
  - 2, 7
- 28
  - 7, 4
  - 4: 2, 2

14: 2 x 7

28: 2 x 2 x 7

GCF - Greatest Common Factor

14: 2 x 7
28: 2 x 2 x 7

When you are done with doing the prime factorization, you list the prime factors like this (the ones that you circled)

Next you circle the common factors so you would circle the two's together, one from 14 and one from 28 and you will circle the seven's together.

GCF - Greatest Common Factor

14: 2 x 7
28: 2 x 2 x 7

2 x 7 = 14

GCF = 14

The next thing you would do is multiply The common factors (2 x 7), make sure you only multiply by two once! The answer is 14 and is the GCF.

LCM – Least Common Multiple

- Least Common Multiple or LCM is the smallest multiple that two or more numbers have in common, (this excludes zero). LCM is very similar to GCF except you are finding the a multiple instead of a factor.
- You can find LCM by using the same methods as GCF: writing the multiples (not factors) or by using Prime Factorization.

LCM – Least Common Multiple

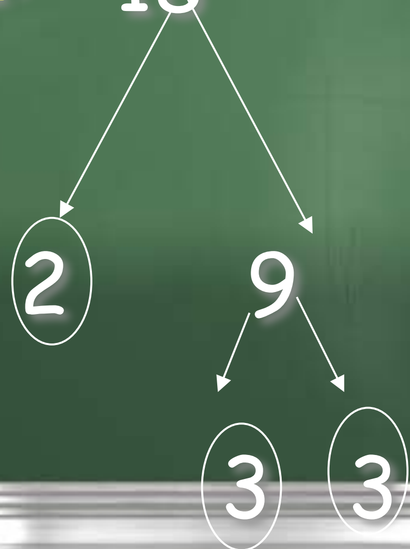
- Example of listing multiples to find the LCM
- List the Multiples of 12 and 18 until both reach a common multiple
- 12: 0, 12, 24, 36
- 18: 0, 18, 36

LCM – Least Common Multiple

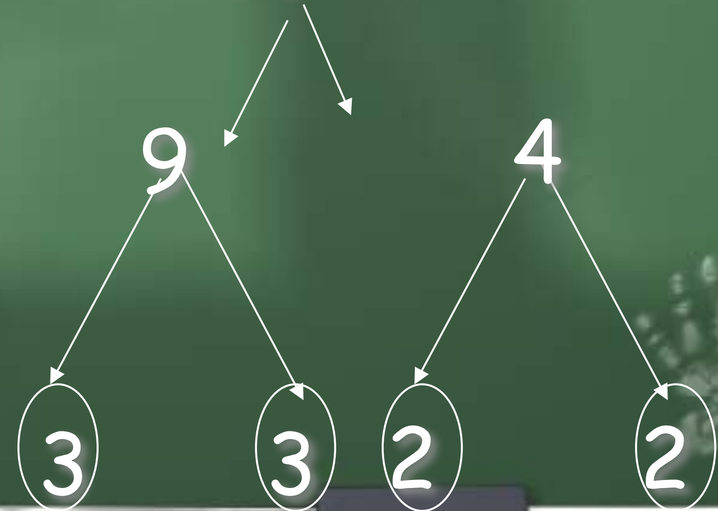
- The Least Common Multiple of 12 and 18 is 36.
- On the following page you will see how to find the Least Common Multiple using Prime Factorization.

LCM – Least Common Multiple

- LCM using Prime Factorization
  - 18



  - 36



LCM – Least Common Multiple

12: 2 x 9

18: $2^2 \times 3^2$

When you are done with doing the prime factorization, you list the multiples you circled and if there is more than one of a certain multiple you write it as an exponent.

LCM – Least Common Multiple

12: 2×9

18: $2^2 \times 3^2$

$2^2 \times 3^2 \times 9$

LCM = 324

Next, write the higher multiple of each number, which is 2^2, 3^2, and 9.
The answer is 324 and is the LCM.

TRY THESE!

- Find the GCF AND LCM of the following sets of numbers:
- 90, 84; 8, 128; 52,26; and 28, 34

Decimals to Fractions

- There are two types of decimals, terminating decimals and repeating decimals. The following slide shows you how to change a terminating decimal into a fraction.

Terminating Decimals to Fractions

- Change 0.87 into a fraction
- First, the seven in 0.87 is in the hundredths place so it will be written as a fraction in the following way:
- $\frac{87}{100}$

Terminating Decimals to Fractions

- $\frac{87}{100}$
- You check to see if it can be reduced and it can't so, 0.87 as a fraction is $\frac{87}{100}$

Repeating Decimals to Fractions

- Write 0.7… as a fraction
- First use *N* as a variable to represent the number
- Let N = 0.7….
- Multiply both sides by ten
- 10(N) = 10 (0.777…)
- 10 (N) = 7.777…..

Repeating Decimals to Fractions

- 10 (N) = 7.777…..
- Next, you subtract "N" from the 10N so the the number is no longer repeating. So, you subtract the original number from the product you got when multiplying 0.7… by 10.
- 10(N) = 7.777…

$$
\begin{array}{rl}
 & 10(N) = 7.777\ldots \\
- & \underline{\quad N \quad = 0.777} \\
 & 9N = \quad 7.0
\end{array}
$$

Repeating Decimals to Fractions

- $9N = 7$
- Next, you divide both 9N and 7 by 9.
- $\frac{9N}{9} = \frac{7}{9}$

You eliminate the nine and $\frac{7}{9}$ can't be simplified so the final answer is:

$$N = \frac{7}{9}$$

Fractions to Decimals

- You can change fractions to decimals by dividing the numerator by the denominator.
- Write $\frac{5}{9}$ as a decimal.
- You would divide 5 by 9

Fractions to Decimals

- 5 / 9 = 0.5.....
- When you are changing a fraction to a decimal, do a division problem to find the answer. Most of the time, the answer is repeating.

TRY THESE!

- For the following problems depending on the type of number, change from decimals to fractions or from fractions to decimals:
- 0.72…
- 0.782
- $\frac{7}{9}$

I hope this slideshow helped you understand these math concepts better!

☺

- Max Study