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Clear-Sighted Statistics: Appendix 1: Order of Mathematical Operations Transcript

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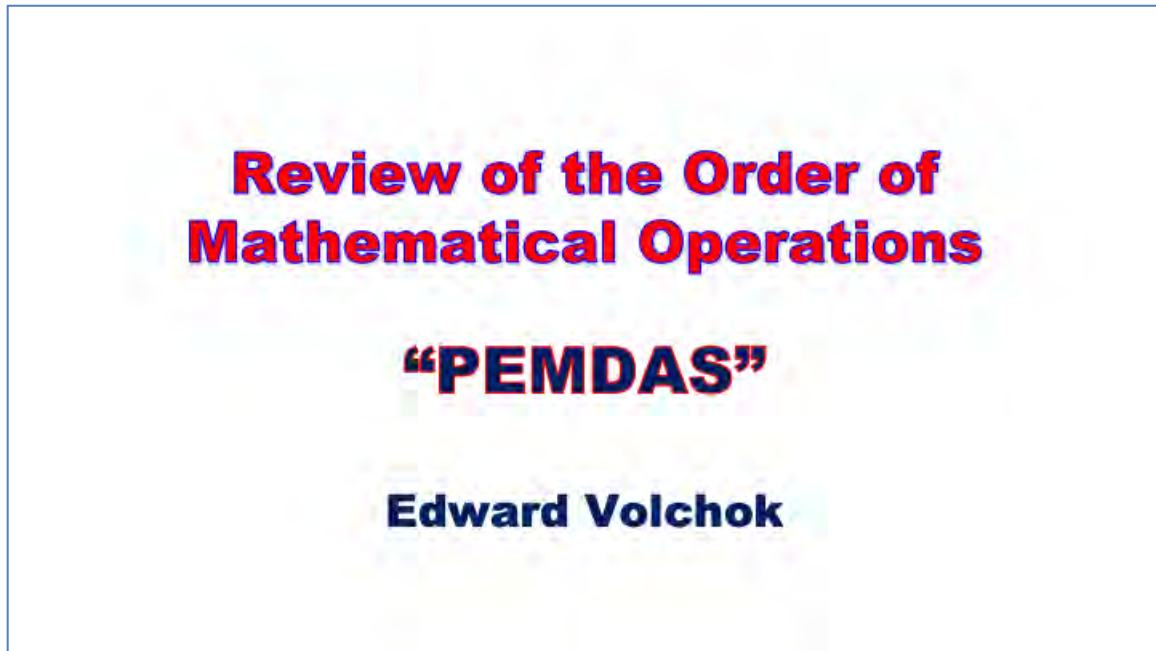
Contact: AcademicWorks@cuny.edu

Order of Mathematical Operations Transcript

This video is available at:

https://www.youtube.com/watch?v=IXLrFjw2_TA&feature=youtu.be

Screen 1:



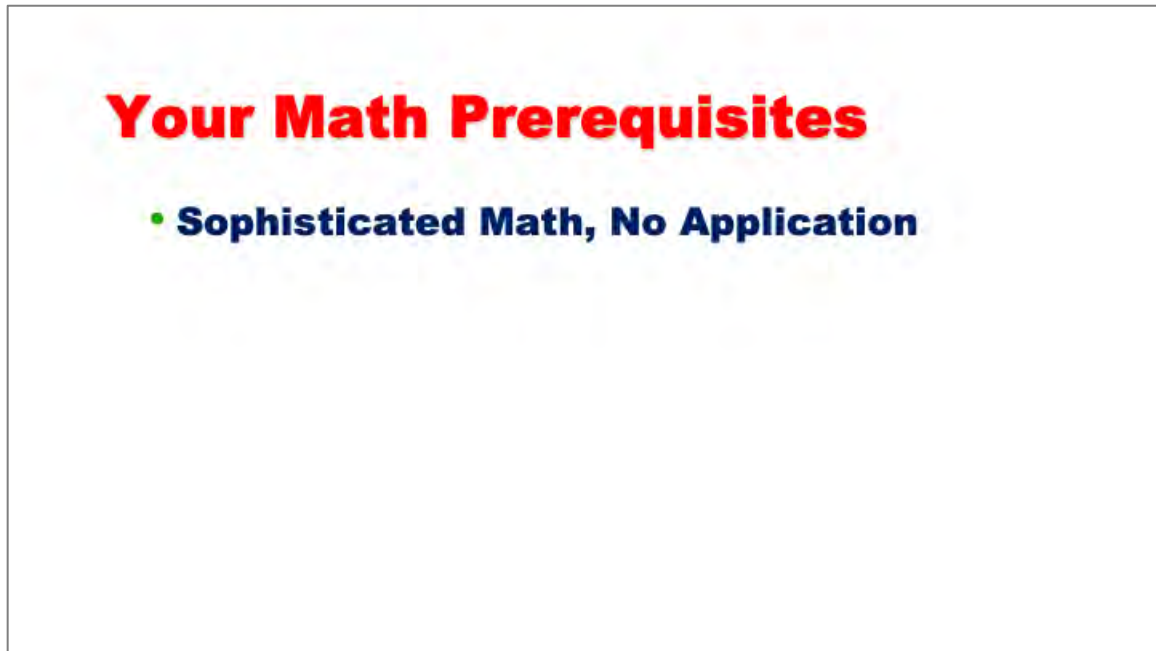
Audio:

Hello. This is Edward Volchok. Welcome to my video on the order of mathematical operations. This video is intended for students taking my Statistics class who may need to brush up on basic mathematics.

Video:

Text: Review of Basic Mathematics: Order of Mathematical Operations, "PEMDAS" and, the author's name, Edward Volchok.

Screen 2:



Your Math Prerequisites

- **Sophisticated Math, No Application**

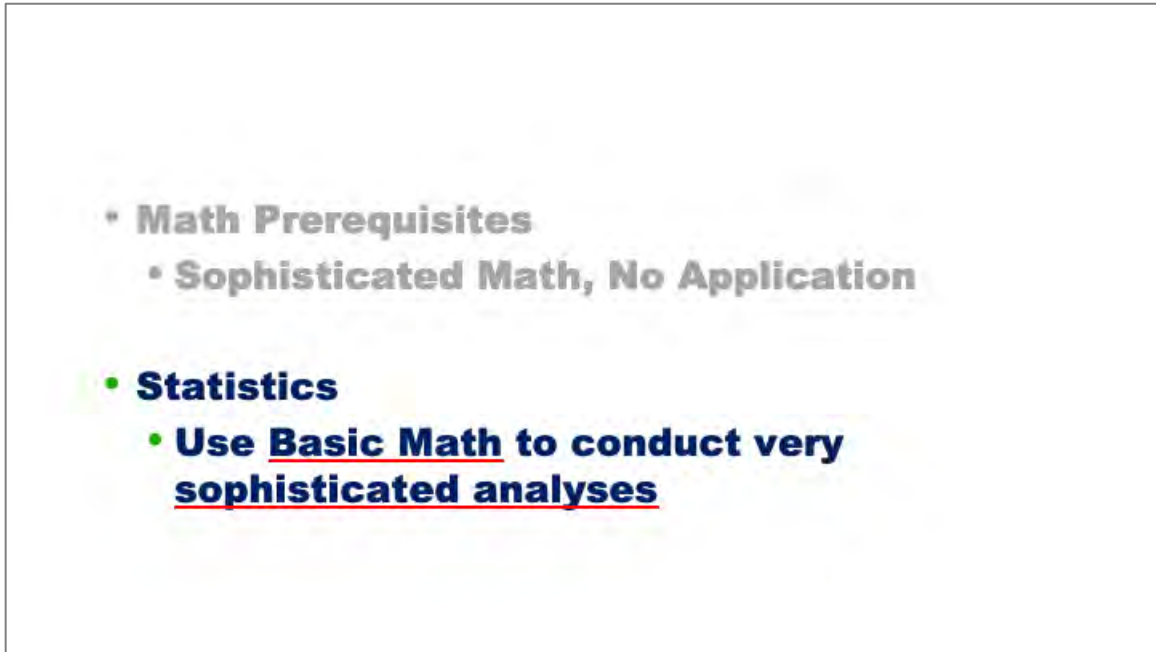
Audio:

Students taking Statistics are required to have completed mathematics prerequisites. In these prerequisite courses you learned sophisticated mathematics, but most likely you were not required to apply the techniques you learned to real-world problems.

Video:

Text: Math Prerequisites. Sophisticated Math, No Application.

Screen 3:



Audio:

In our Statistics class, we will use basic math to conduct very sophisticated analyses.

Video:

Text: Use Basic Math to conduct very sophisticated analyses.

Order of Mathematical Operations

- **Procedural rules for solving mathematical expressions**

Screen 4:

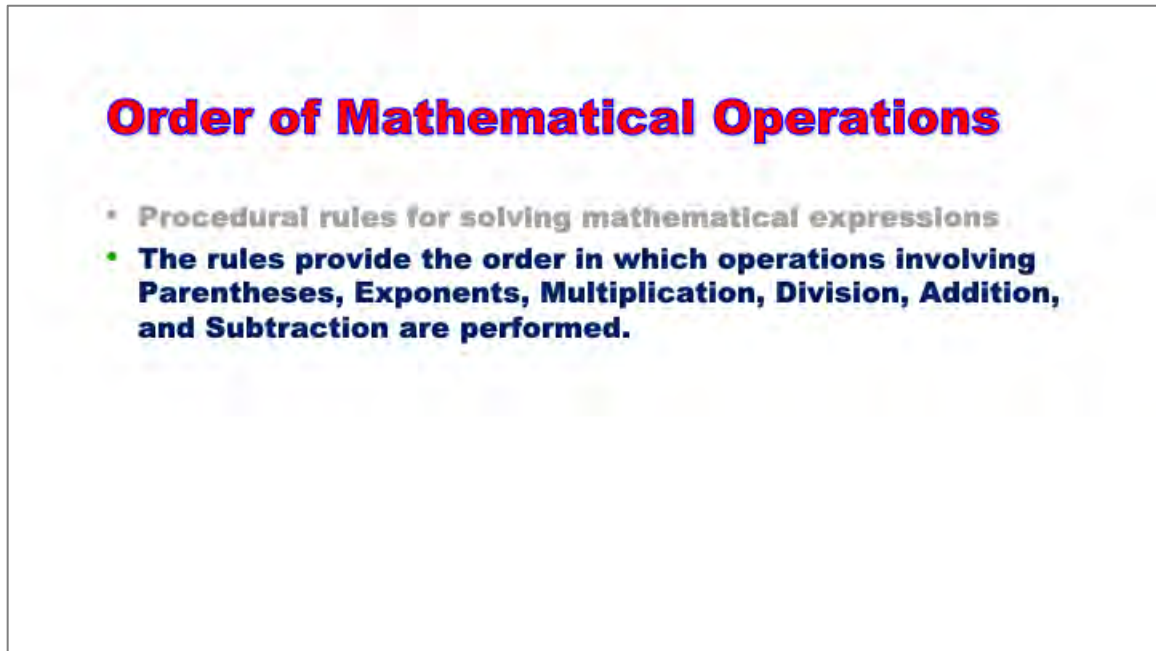
Audio:

To succeed in Statistics, you must know the Order of Mathematical Operations, which are the procedural rules for solving mathematical expressions.

Video:

Text: Procedural rules for solving mathematical expressions.

Screen 5:



The screenshot shows a presentation slide with a white background and a thin black border. At the top center, the title "Order of Mathematical Operations" is written in a large, bold, red font. Below the title, there are two bullet points. The first bullet point is a grey square followed by the text "Procedural rules for solving mathematical expressions". The second bullet point is a green square followed by the text "The rules provide the order in which operations involving Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction are performed." The text in the second bullet point is bolded.

Order of Mathematical Operations

- Procedural rules for solving mathematical expressions
- **The rules provide the order in which operations involving Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction are performed.**

Audio:

These rules provide the order in which operations involving parentheses, exponents, multiplication, division, addition, and subtraction are performed.

Video:

Text: Provides the operational precedence for performing operations involving Parentheses, Exponents, Multiplication, Division Addition, and Subtraction.

Screen 6:

Order of Mathematical Operations

- Procedural rules for solving mathematical expressions
- Provides the operational precedence for performing operations involving Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction
- **These rules apply whether calculations are performed by hand or using a computer application**

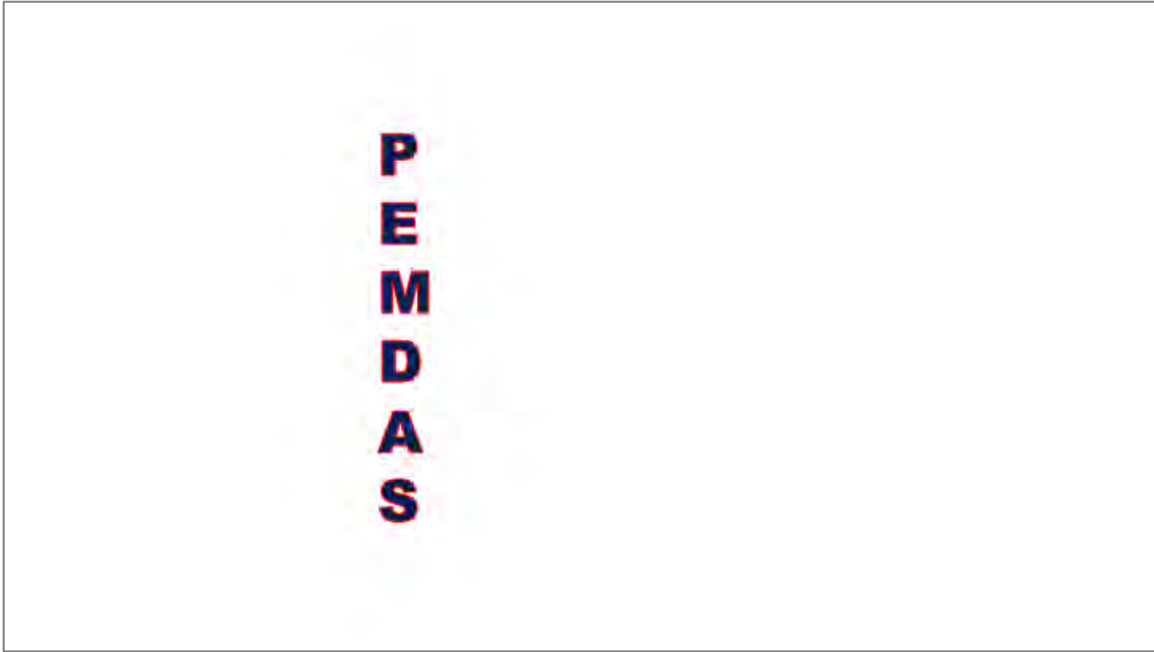
Audio:

And, these rules apply whether calculations are performed by hand or using a computer application.

Video:

Text: These rules apply whether calculations are performed by hand or using a computer application.

Screen 7:



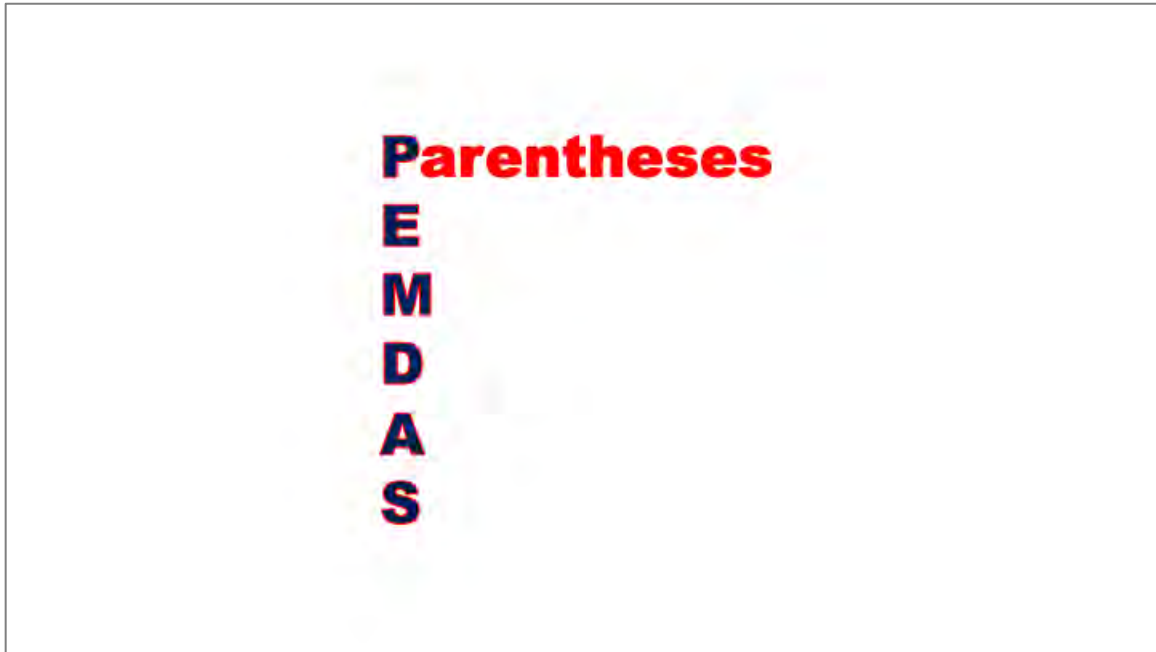
Audio:

We summarize these rules with an acronym: PEMDAS, P-E-M-D-A-S. PEMDAS provides the order of mathematical operations.

Video:

Text: Letters spell out "P-E-M-D-A-S."

Screen 8:



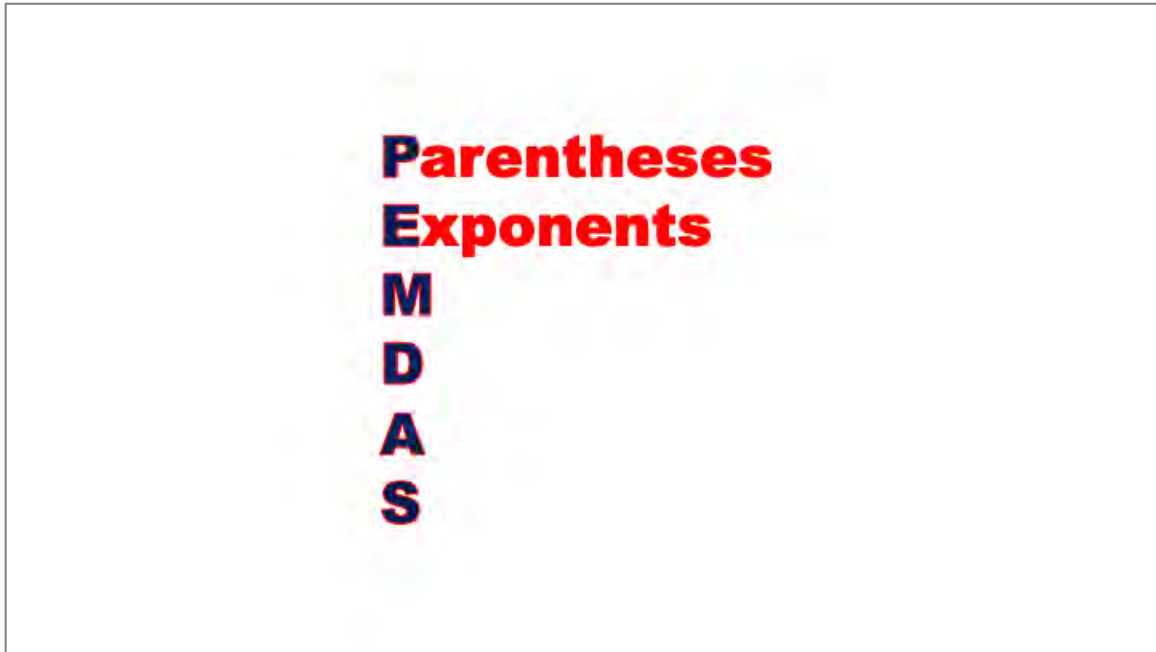
Audio:

"P" stands for Parentheses. Our first step in solving an expression is to complete the operations within the parentheses.

Video:

Text: Letters spell out "P-E-M-D-A-S." The word "Parentheses" replaces the "P."

Screen 9:



Audio:

“E” stands for Exponents. Our second step is to calculate all exponents.

Video:

Text: Letters spell out “P-E-M-D-A-S.” The word “Exponents” replaces the “E.”

Screen 10:



Audio:

"M" stands for Multiplication and "D" stands for Division. Our third step is to perform operations of multiplication and division as we move left to right through the expression.

Video:

Text: Letters spell out "P-E-M-D-A-S." The word "Multiplication" replaces the "M," and the word "Division" replaces the "D."

Screen 11:



Audio:

And, finally, “A” stands for Addition and “S” for Subtraction. Our fourth and last step is to complete the operations of addition and subtract as we move left to right through the expression.

Video:

Text: Letters spell out “P-E-M-D-A-S.” The word “Addition” replaces the “A,” and the word “Subtraction” replaces the “S.”

Screen 12:

PEMDAS:

Step 1: Perform Operations Within Parentheses

$$3*(4+9) - 3^2/4+3$$

Audio:

Let's solve this mathematical expression: 3 times open parentheses 4 + 9 close parentheses minus 3 squared over 4 plus 3.

Video:

Text: The screen shows a problem: $3 * (4 + 9) - 3^2/4 + 3$.

Screen 13:

PEMDAS:

Step 1: Perform Operations Within Parentheses

$$3*(4+9) - 3^2/4 + 3 =$$

$$3*(13) - 3^2/4 + 3$$

Audio:

Our first step is to solve the operations within the parentheses. Working within the parentheses, $4 + 9$ becomes 13. Our expression now becomes:

$$3 * (13) - 3^2/4 + 3.$$

Video:

Text: $3 * (4 + 9) - 3^2/4 + 3$. And, the first step toward its solution:

$$3 * (13) - 3^2/4 + 3.$$

Screen 14:

**PEMDAS:
Step 2: Calculate Exponents**

$$3 * (13) - 3^2/4 + 3 =$$

$$3 * (13) - 9/4 + 3$$

Audio:

Our second step is to calculate exponents. 3^2 is our exponent. So, 3^2 equals 9. And, our expression now becomes 3 times 13 minus 9 over 4 plus 3.

Video:

Screen shows the second step of the problem: $3 * (13) - 3^2/4 + 3$ becomes $3 * (13) - 9/4 + 3$.

Screen 15:

PEMDAS:

Step 3: Multiplication & Division (Move Left to Right)

$$3 * (13) - 9/4 + 3 =$$

$$39 - 2.25 + 3$$

Audio:

Our third step is to perform the operations of multiplication and division as we from through the expression from left to right. $3 * (13) - 9/4 + 3$ becomes $39 - 2.25 + 3$.

Video:

Screen shows the third step of the problem: $3 * (13) - 9/4 + 3$ becomes $39 - 2.25 + 3$.

Screen 16:

PEMDAS:

Step 4: Addition & Subtraction (Move Left to Right)

$$39 - 2.25 + 3 =$$

$$36.75 + 3 = 39.75$$

Audio:

Our fourth and final step is to perform the operations of addition and subtraction as we from through the expression from left to right.

$39 - 2.25 + 3$ becomes $36.75 + 3$, which is 39.75 , our final answer.

Video:

Screen shows the fourth step of the problem: $39 - 2.25 + 3$ becomes $36.75 + 3$, which is 39.75

Screen 17:



Audio:

We can use a mnemonic to help us memorize the order of operations. A mnemonic is a device that aids memory.

Video:

Text: The phrase "The mnemonic..." appears on screen.

Screen 18:



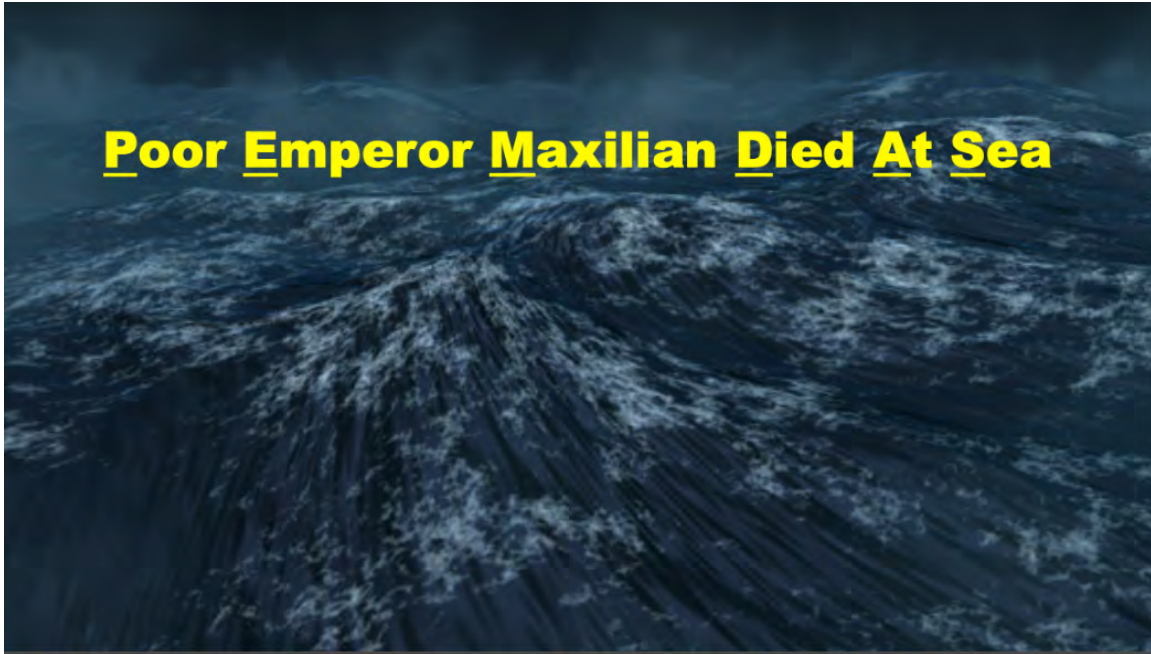
Audio:

PEMDAS: "P," "E," "M," "D," "A," "S." POOR EMPEROR MAXIMILAN DIED AT SEA. Again: POOR EMPEROR MAXIMILAN DIED AT SEA. The order of operations: Parentheses, Exponents, Multiplication and Division, and Addition and Subtraction are easy to remember when you think of our mnemonic...

Video:

Text: The "PEMDAS" acronym appears on screen.

Screen 19:



Audio:

Poor Emperor Maximillian died at sea. Poor Emperor Maximillian died at sea.

Video:

Text: "Poor Emperor Maximillian Died At Sea" appears over a video of a rough, storm-tossed sea.

Screen 20:



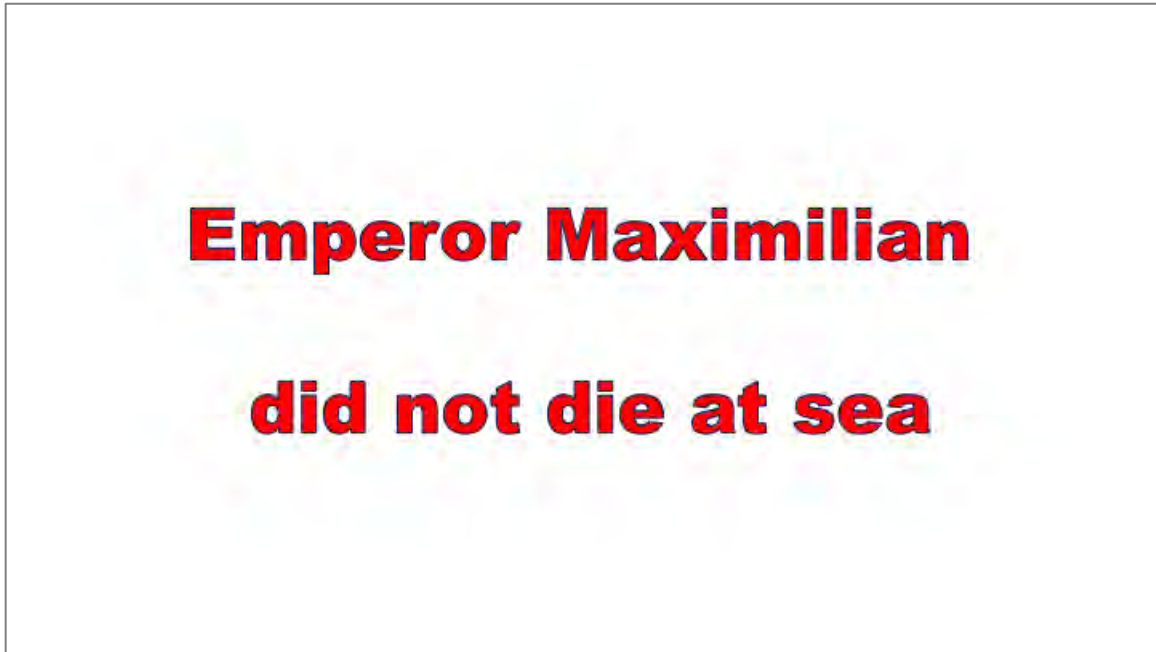
Audio:

I should point out the while “poor Emperor Maximilian died at sea” is a great mnemonic, it is poor history.

Video:

Text: The words “Good Mnemonic, Bad History” appear along with the “PEMDAS” acronym.

Screen 21:



Audio:

It is a fact: No emperor named Maximilian ever died at sea.

Video:

Text: "Emperor Maximilian did not die at sea."

Screen 22:



**Emperor Maximilian I
of Mexico
(1832 - 1867)**

Audio:

Here's Emperor Maximilian I of Mexico who died in 1867....

Video:

Screen: A photograph of Emperor Maximilian I of Mexico.

Screen 23:



Edouard Manet's "Execution of Emperor Maximilian I"

Audio:

He was executed by a firing squad. The event is memorialized in Manet's painting, "The Execution of Emperor Maximilian I."

Video:

Screen: Edouard's Manet's famous painting, "The Execution of Emperor Maximilian I."

Screen 24:

Maximilian II

**Died in Bavaria
while preparing to
invade Poland by
land.**



Emperor Maximilian II
Holy Roman Empire
1527-1532

Audio:

Emperor Maximilian II of the Holy Roman Empire died on land in Bavaria in 1532 while he was planning to invade Poland—by land.

Video:

Screen: Painting of Emperor Maximilian II of the Holy Roman Empire appears with the words “Died in Bavaria while preparing to invade Poland (by land).”

Screen 25:

Maximilian I

Died in Wels, Austria



**Emperor
Maximilian I
Holy Roman Empire
(1459 – 1519)**

Audio:

And, Emperor Maximilian I died on unknown causes in Austria in 1519.

Video:

Screen: A painting of Emperor Maximilian I of the Holy Roman Empire appears with the words “Died in Weis, Austria.”

Screen 26:



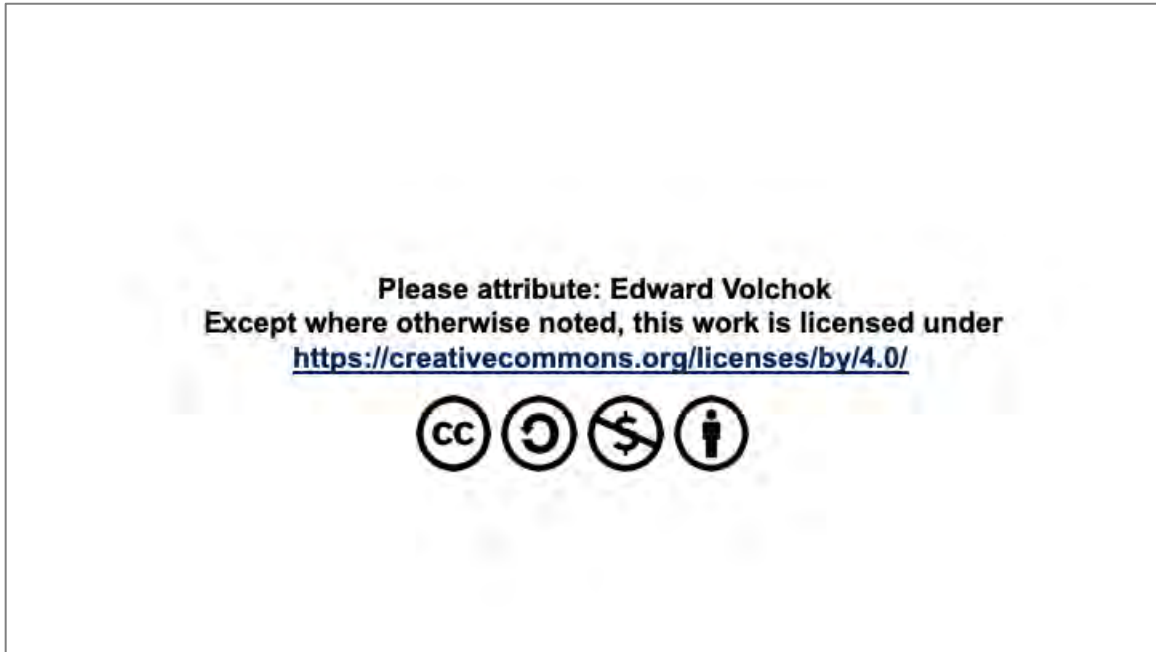
Audio:

Thank you and good-bye.

Video:

Video shows a graphic with the words "The End."

Screen 27:



Audio:

There is no audio.

Video:

Video of the Creative Commons license.