



Helping Students Conquer Math Anxiety

BRIAN CAFARELLA, PH.D.

1



Welcome!

- ▶ Please take a few minutes to complete the survey attached in the chatbox.
- ▶ When finished, add up the number of A's and B's.
- ▶ We will discuss the results later.

2

Please click the below link and answer the question

<https://www.surveymonkey.com/r/2CVHHVP>

3

Ways to Engage without Anxiety

- ▶ Survey Questions
- ▶ Pair share
- ▶ Remind App
- ▶ One minute Essay (What I have learned? What are the muddy points?)

4

Root Causes and Suggestions Regarding Math Anxiety

Causes

- ▶ Past Experiences (Math Bully)
- ▶ Math Terminology
- ▶ Fear of Failure
- ▶ Ambiguity

Suggestions

- ▶ Math Autobiography.
- ▶ Drop definitions into discussion.
- ▶ Be excited over mistakes.
- ▶ Help students zoom in.

5

Biggest Reason for Non-Success in Math?

- ▶ The lack of proper pre-requisite skills.
- ▶ Students need to know the basic required skills for a class before entry.

6

A College Algebra Example

▶ Solve: $\log_{(2x+3)} + \log_{(x-2)} = \log 4$

To Solve this:

- ▶ Recognize Quadratic Equations and get them in the correct form.
- ▶ Understand how to factor: $2x^2 - x - 10 = 0$ and solve.
- ▶ Understand how to multiply polynomials.
- ▶ Understand how to solve linear equations.
- ▶ Understand laws of exponents.
- ▶ Strong Number Sense.

7

Which personality are you?

Quantitative

- ▶ Top-down approach.
- ▶ Prefer formulas.
- ▶ Steps and procedures.
- ▶ Prefers one way of solving a problem.
- ▶ Focuses on results.

Qualitative

- ▶ Attempts to understand why something works.
- ▶ Looks to identify patterns.
- ▶ Enjoys visuals and real-life applications.
- ▶ Conversations and different ways to approach a problem.

8

Example of Quantitative versus Qualitative Thinking

Factoring – Trial and Error

- ▶ Factor: $6x^2 + 11x + 3$
- ▶ Start with two blank parenthesis: $(\quad)(\quad)$.
- ▶ Use trial and error. Consider the multiples of 6 ($6 \cdot 1, 3 \cdot 2$) and the multiples of 3 ($3 \cdot 1, 1 \cdot 3$), try various combinations in two sets of blank parenthesis where you arrive at a middle term of 11.
- ▶ $(2x + 3)(3x + 1)$

Factoring – AC Method

- ▶ Factor: $6x^2 + 11x + 3$
- ▶ Multiply $a \cdot c$ and get 18
- ▶ What pair of numbers multiplies to 18 and adds to 11? That is 9 and 2.
- ▶ Replace the middle term $11x$ with $9x$ and $2x$: $6x^2 + 9x + 2x + 3$.
- ▶ Now, factor by grouping:
- ▶ $3x(2x + 3) + 1(2x + 3)$
- ▶ Factor out the $(2x + 3)$:
- ▶ $(2x + 3)(3x + 1)$

9

Our Challenge

- ▶ What personality do you gravitate to?
- ▶ How can you accommodate both sets of "math personalities?"

10

Helping Students Navigate the Modern-Day System

- ▶ Legitimate online resources (e.g., Kahn Academy, Brian McLogan).
- ▶ Navigating ChatGPT.
- ▶ Pros and cons on various modalities: face-to-face, online, emporium model.

11

Most “Hated” Math Topics

- ▶ Fractions
- ▶ The Laws of Exponents
- ▶ Probability
- ▶ Factoring
- ▶ Slope of a Line
- ▶ Geometry (angles, lines, and planes)
- ▶ Word Problems

12

Test-taking Tips

- ▶ Combat "Fight or Flight" by using the Data Dump (aka the Memory Dump of the Data Drop off). Students take 5- 10 minutes to write down formulas or information to help them remember the content. Students can practice this before the exam.
- ▶ Begin the exam by searching for the most familiar problem.
- ▶ Create a song or even a dance to help you remember content.

13

My Information

- ▶ Brian Cafarella
- ▶ Email: brian.cafarella@sinclair.edu
- ▶ Phone: (937)-422-6116

14

My Author Information

Books:

- ▶ "Math Anxiety- How to Beat it"
- ▶ "Community College Mathematics: Past, Present, and Future"
- ▶ "Breaking Barriers: Student Success in Community College Mathematics."

Articles:

- ▶ "Eliminating Stand-alone Developmental Mathematics? Please Answer some Questions."

<https://home.schoolcraft.edu/cce/29.1.58-70.pdf>

15

Articles (continued)

- ▶ "Community College Perspectives Regarding Quantway"
<https://www.tandfonline.com/doi/abs/10.1080/10668926.2020.1719940>
- ▶ "The Myths of Redesign in Developmental Mathematics"
<https://www.jstor.org/stable/44290295>
- ▶ "Developmental Mathematics: What's the Answer?"
<https://home.schoolcraft.edu/cce/22.1.55-67.pdf>

16

Articles (continued)

- ▶ “Acceleration and Compression in Developmental Mathematics: Faculty Viewpoints.

<https://www.jstor.org/stable/44987379>

- ▶ “Developmental Education: Then and Now”

- ▶ “Exploring Best Practices in Developmental Mathematics.”

<https://www.jstor.org/stable/90011845>