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# To Fall in Love with Math, Do This

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## Synopsis

In the viral New York Times essay “To Fall in Love with Anyone, Do This”, Mandy Len Catron details an experience she and an acquaintance had as they shared responses to psychologist Arthur Aron’s thirty-six questions intended to make participants fall in love. She notes that “we all have a narrative of ourselves that we offer up to strangers and acquaintances, but Dr. Aron’s questions make it impossible to rely on that narrative”. In this paper, we claim that we also have narratives of our relationship to mathematics that we offer up to ourselves and others. Following, we offer a mathematical version on Aron’s thirty-six questions, designed to break out of our personal mathematical narratives and foster intimacy with mathematics.

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In the viral New York Times essay “To Fall in Love with Anyone, Do This” [2], Mandy Len Catron details an experience she and an acquaintance had as they shared responses to psychologist Arthur Aron’s thirty-six questions intended to make participants fall in love. Like the original participants in Aron’s decades-old study [1], Catron and her acquaintance fell in love after sharing responses. In her essay, she describes how the level of vulnerability increased gradually. She points out that “we all have a narrative of ourselves that we offer up to strangers and acquaintances, but Dr. Aron’s questions make it impossible to rely on that narrative”.

We also have narratives of our relationship to mathematics that we offer up to ourselves and others. Furthermore, many of us might benefit from a deliberate effort to cultivate vulnerability and break out of our personal mathematical narratives.

Below is my version of Aron's thirty-six questions, altered to foster intimacy with mathematics for those who might desire to cultivate or rekindle a love of mathematics.

### **Instructions**

*To fall in love with math, do this: Set aside 90 minutes in order to contemplate the following thirty-six questions. Then perform the four-minute final task.*

### **Set I**

1. Given the choice of any mathematically-inclined person throughout history, whom would you want as a dinner guest? You might consider, but are not limited to:
  - (a) Archimedes, a man so moved by the realization that the volume of water his body displaced in the public bath was a measure of his mass that he jumped up, yelled "Eureka!", and ran home naked.
  - (b) Évariste Galois, a Frenchman considerate enough to scribble a letter outlining some mathematical ideas he had in mind just before dying in a duel at the age of twenty. His notes later formed the basis for Galois Theory, a major branch of abstract algebra.
  - (c) Leonardo DaVinci, an artist who used math, including the golden ratio, to enhance paintings that have endured for centuries.
  - (d) Emmy Noether, a German Jewish woman who ignored restrictions on women's engagement in math, lectured under Hilbert's name, and was dubbed by Einstein as "the most significant creative mathematical genius thus far produced since the higher education of women began".
  - (e) Srinivasa Ramanujan, an Indian with no formal training in math but a belief that he was expressing God's thoughts as he made thousands of significant contributions to mathematical analysis, number theory, and infinite series.
  - (f) Claude Shannon, an American inspired by childhood hero Thomas Edison, who developed the field of information theory, paving the way for the internet.

- (g) Evelyn Boyd Granville, the second African-American woman to earn a mathematics doctorate,<sup>1</sup> who later worked at the United States Space Technology Laboratories and North American Aviation Space and Information Systems Division where she contributed to the Apollo program.
- (h) Beethoven, a musician who used mathematics to compensate for his deafness as he composed pieces that have endured for centuries.
2. Would you like to be famous for doing math? In what way? You might consider (but are not limited to) mathematical fame based on a facility for mental computations, an ability to infuse art with mathematical patterns or concepts, or contributions to society reinforcing personal, medical, financial, and national security data.
  3. Before talking to someone else about math, do you ever rehearse what you are going to say? Why or why not?
  4. What would constitute a “perfect” math day for you? Dream a bit here. Would you be alone or with others? Would your time be spent understanding or explaining the math? Would the math be applied or theoretical? Would you be wearing tweed in an ivy-covered, stone, academic building, wearing chest-high, rubber waders on a marine biologist’s research vessel making sense of microscopic phytoplankton data, or in some other setting? Would you feel calm, excited, nervous, elated, or something else?
  5. When have you thought about math on your own, just because it was interesting? When have you discussed math with someone else, just because it was interesting?
  6. If you were able to live to the age of 90 and retain either the mind you had for math as a child or a general façade—accurate or not!—that you are a “math” person for the last 60 years of your life, which would you want?
  7. Do / did you have a secret hunch about how and when you will stop / stopped doing math?

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<sup>1</sup> See <http://www.math.buffalo.edu/mad/wohist.html>, last accessed on January 25, 2018.

8. Name three things you and math have in common.
9. For what in your mathematical life do you feel most grateful?
10. If you could change anything about the way you were taught math, what would it be?
11. Take four minutes to recount your detailed math history.
12. If you could wake up tomorrow having gained any one quality or ability in math, what would it be?

**Set II**

13. If a crystal ball could tell you one truth about your mathematical self, your mathematical education (formal or not), your mathematical future or anything else related to your engagement with math, what would you want to know?
14. Is there something you've dreamed of doing in math? Why haven't you done it?
15. What is your greatest mathematical accomplishment, no matter how big or small?
16. What do you value most in a friend with whom to do math?
17. What is your most treasured math memory?
18. What is your most terrible math memory?
19. If you knew that in one year you would die suddenly, would you change anything about your current engagement with math? Why?
20. What does a "math friend" mean to you?
21. What role does love play in your math life? What role could it play?
22. Text a friend and alternate sharing something you consider a positive mathematical characteristic of your friend. Share five items.
23. When you did math as a child, how close and warm was your family? Was the family setting in which you came of age mathematically better or worse than most others?
24. How did your mother affect your abilities to learn math? Your father?

**Set III**

25. Make three true, positive statements about you and math. For instance, "Right now, my feelings about math can be described as . . . "
26. Complete this sentence: "I wish math could offer me . . . "
27. If math were a person with whom you planned to become close, what would be important for "math" to know?
28. What is one thing that you like about math? Try to surprise yourself here.
29. Have you ever had an embarrassing math experience? If this had happened to a friend or child instead of you, how would you view the friend or child?
30. When did you last feel vulnerable while doing math? Were you with others or by yourself?
31. Name one thing that you like that could be described, however tangentially, as mathematical.
32. What in math, if anything, is too serious to be joked about?
33. If you were to die tonight with no opportunity to communicate with anyone, what would you most regret not having told someone about your math history? Why haven't you told them yet?
34. You sustain a head injury that affects your memory. If you could salvage one facet of your mathematical self from before the head injury, what would it be? Why?
35. Of all the people in the history of your engagement with math, whose absence would you have missed the most? Why?
36. Text a friend to share a problem you have experienced in math and ask for advice on how to handle it. Also, ask your friend to reflect back to you how you seem to feel about the math problem.

**Final Task:**

Identify a visual or audio piece of math about which you are curious. The piece could be a mathematical proof, series of equations, graph, data table, geometric sketch, topological object, or a math-inspired musical composition or painting. Find a comfortable position and stare at/listen to the piece for four, quiet, uninterrupted minutes. If your mind wanders, gently bring it back to the piece and the math it contains. For now, do not worry about any math in the piece that you do not understand. Simply appreciate the math you recognize as interesting, beautiful, or in possession of other positive attributes. Be confident that the math wants to be liked by you. Be kind to yourself. Smile. Breathe.

**References**

- [1] Arthur Aron, Edward Melinat, Elaine N. Aron, Robert Darrin Vallone, and Renee J. Bator, “The Experimental Generation of Interpersonal Closeness: A Procedure and Some Preliminary Findings”, *Personality and Social Psychology Bulletin*, Volume **23** Issue 4 (1997), pages 363–377. Available online at <http://journals.sagepub.com/doi/pdf/10.1177/0146167297234003>, last accessed on January 25, 2018.
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