

## Mathematics Attitude Questionnaire

The purpose of this questionnaire deals with identifying perceptions and attitudes towards mathematics and how those might change over the course of a student's progression through their undergraduate (and beyond experiences). Please include any additional comments (where applicable) that you think would be of value. Your responses to this survey will be completely anonymous.

- Please answer all questions.
- Please circle the answer(s) most appropriate for you.
- Some questions require you to numerically rank the options in the blank spaces provided.
- When prompted for written explanations, please write clearly and legibly.

### General Attitude Towards Mathematics

1. Mathematics is a science. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

2. Mathematics is a language (e.g., a set of tools to express scientific ideas). [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

### Comments

3. Mathematics is \_\_\_\_\_. [Choose one]

- (a) Exciting
- (b) Boring
- (c) Neither

4. Mathematics is \_\_\_\_\_. [Choose one]

- (a) Difficult
- (b) Easy
- (c) Neither

5. There is nothing creative about mathematics; it's just memorizing formulas and things.  
[Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

6. In general, I feel comfortable with mathematics. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

Comments

7. My peers tend to feel comfortable with mathematics. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

Comments

8. Generally, people tend to feel comfortable with mathematics. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

Comments

9. A college mathematics course should cover a wide range of topics so to broadly expose one to different areas/approaches. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

10. A college mathematics course should focus on a core set of principles so to really understand those ideas deeply. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

11. What skills do you think make a student good at mathematics? [Rank the three most important choices in order, 1 being the most important.]

- \_\_\_ Critical thinking
- \_\_\_ Being a neat writer
- \_\_\_ Effective communication skills (verbal and written)
- \_\_\_ Ability to think abstractly
- \_\_\_ Previous studies (e.g., having taken numerous courses)
- \_\_\_ Attitude

Please provide rationale for your top choice:

12. When confronted with a mathematical problem I do not know how to solve, the first thing I would likely do is: [Rank the three most relevant in order, 1 being the most relevant]

- \_\_\_ Verify I know what the question is asking for
- \_\_\_ Attempt to write down all the known and unknown quantities
- \_\_\_ Try to find information that can help lead to answer (e.g., Google)
- \_\_\_ Ask someone for help
- \_\_\_ Try to think of analogous problems that I already know the answer to
- \_\_\_ Draw a picture/schematic

Please provide rationale for your top choice:

13. Calculators and computers are essential for solving math problems. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

Please explain briefly:

14. Mathematics is a \_\_\_\_\_ subject. [Choose all that apply]

- (a) Qualitative
- (b) Quantitative
- (c) Analytical
- (d) I don't know

15. Rank the following in terms of their relative importance for establishing a grade a student should receive in a mathematics course: [1 to 4, 1 being the most important and 4 the least]

- \_\_\_ Getting the correct answers on homework/exams
- \_\_\_ Having a deep conceptual understanding of the course material
- \_\_\_ Being able to use the material to solve problems not seen in class
- \_\_\_ Amount of time spent on the course (e.g., studying)

Please provide rationale for your top choice:

16. The most important thing in determining a student's grade in a math course should be the effort they put in, not necessarily whether or not they always obtained the correct answers. [Choose one]
- (a) Strongly agree
  - (b) Agree
  - (c) Neutral
  - (d) Disagree
  - (e) Strongly disagree

Please explain briefly:

17. Most problems one faces in the real world typically do not have a 'correct answer' per se. [Choose one]
- (a) Strongly agree
  - (b) Agree
  - (c) Neutral
  - (d) Disagree
  - (e) Strongly disagree

Please explain briefly:

### **Relationship Between Mathematics and Science**

18. College-level mathematics courses are necessary to obtain skills that will be needed later on in college/life. [Choose one]
- (a) Strongly agree
  - (b) Agree
  - (c) Neutral
  - (d) Disagree
  - (e) Strongly disagree

Please explain briefly:

19. The value of a college-level mathematics course is critically dependent upon the specific instructor. [Choose one]
- (a) Strongly agree
  - (b) Agree
  - (c) Neutral
  - (d) Disagree
  - (e) Strongly disagree

Please explain briefly:

20. I took enough mathematics courses while in college. [Choose one]
- \_\_\_\_\_ (a) Strongly agree
  - \_\_\_\_\_ (b) Agree
  - \_\_\_\_\_ (c) Neutral
  - \_\_\_\_\_ (d) Disagree
  - \_\_\_\_\_ (e) Strongly disagree

Please explain briefly:

21. How many mathematics courses do you feel you need to take at the university level? [Choose one]
- (a) 1
  - (b) 2
  - (c) 3
  - (d) 4 or more
  - (e) None

22. Do you feel you have an adequate knowledge of mathematics to be an effective scientist? [Choose one]
- (a) Yes
  - (b) No
  - (c) Not sure

23. Identify ways that mathematical knowledge is used in non-math courses. [Rank the three most important choices in order, 1 being the most important.]
- \_\_\_ Allows one to determine specific relationships amongst various quantities (e.g., linear dependence between two variables)
  - \_\_\_ Helps to visualize data
  - \_\_\_ Provides statistical conclusions
  - \_\_\_ Establishes a framework with which to describe systems (e.g., models)
  - \_\_\_ Other (specify):

Please provide rationale for your top choice:

24. With regard to science in general, what skills are characteristic of a good student? [Rank the three most important choices in order, 1 being the most important.]
- \_\_\_ Critical thinking
  - \_\_\_ Being a neat writer
  - \_\_\_ Effective communication skills (verbal and written)
  - \_\_\_ Ability to think abstractly
  - \_\_\_ Previous studies (e.g., having taken numerous courses)
  - \_\_\_ Attitude

Please provide rationale for your top choice:

25. If I need math in my career, I am sure I can find someone to do it for me. [Choose one]
- (a) Strongly agree
  - (b) Agree
  - (c) Neutral
  - (d) Disagree
  - (e) Strongly disagree

Please explain briefly:

26. I do not understand why life science majors should automatically be required to take advanced mathematics courses. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

Please explain briefly:

27. A life scientist requires a deep understanding of mathematics. [Choose one]

- (a) Strongly agree
- (b) Agree
- (c) Neutral
- (d) Disagree
- (e) Strongly disagree

Please explain briefly:

### **Impressions of Previous Courses**

28. What was your undergraduate mathematics course you liked the most? [Choose one]

- (a) Calculus (single- or multi-variable)
- (b) Differential equations
- (c) Statistics
- (d) Other (specify):

29. What was your undergraduate mathematics course you liked the least? [Choose one]

- (a) Calculus (single- or multi-variable)
- (b) Differential equations
- (c) Statistics
- (d) Other (specify):

30. Please specify what upper division (300-level or higher) mathematics courses you are currently taking or have already taken. [Choose all that apply]

- (a) Calculus-based statistics and/or probability
- (b) Analysis (real or complex)
- (c) Linear algebra
- (d) Ordinary/partial differential equations
- (e) Advanced geometry
- (f) Mathematical modeling
- (g) Numerical analysis
- (h) Other (specify):

## **Demographics**

31. My undergraduate major was: [fill in]

32. I have an advanced degree (e.g., PhD, masters): [Choose one]

- (a) Yes
- (b) No

If yes, please specify type/area of study:

33. I am a: [Choose one]

- (a) Male
- (b) Female

34. I teach \_\_\_\_\_. [Choose all that apply]

- (a) Science & Engineering majors
- (b) Non-science majors (e.g., Gen-Ed requirement)
- (c) Nursing students
- (d) Veterinary students
- (e) Other (specify)

35. I teach at a \_\_\_\_\_. [Choose all that apply]

- (a) Public university
- (b) Private university
- (c) Community college
- (d) Other (specify)