

Match these women with their accomplishments & photographs

1. Alice Turner Schafer
2. Shakuntala Devi
3. Sophie Germain
4. Ruth Gonzales
5. Sonia Kovalevskia
6. Vivienne Malone Mayes

- A. Her work on Fermat's Last Theorem laid the groundwork that mathematicians would follow for centuries.
- B. The first woman to earn a PhD in math, she wrote ground-breaking theorems in differential equations and rigid body motions.

- C. The Guinness Book of World Records names her as "the human computer"; she authored many recreational mathematical books.
- D. A founder of the Association for Women in Mathematics, she was elected a fellow of AAAS and won the distinguished service award from the MAA.

- E. She did research in functional analysis; she served on the board of the National Association of Mathematicians and the Association for Women in Math.
- F. The Exxon Production Research Company relies on her research in geophysical mathematics.



α



β



γ



δ



ϵ

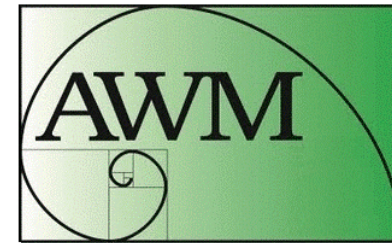


ω

Solutions: 1D ω , 2C β , 3A δ , 4F α , 5B γ , 6E ϵ
 7) b. (8) $10 \cdot 4^5 / (52 \cdot 51 \cdot 50 \cdot 49 \cdot 48 / 4!) = 10,240 / 2,598,960 \approx 0.39\%$. 9) Newton's Law of Cooling says that things cool at a rate proportional to the difference between their temperature and room temperature. So the temperature of the jello drops more when it's hot. Wait, and then add the cold water at the end of the hour. 10) This sequence of twenty digits repeats: $\{1, 4, 7, 6, 5, 6, 3, 6, 1, 0, 1, 6, 3, 6, 5, 6, 7, 4, 1, 0\}$ 11) The sequence converges to 2. 12) This is a hard one! 101 is prime; the number is not prime if there are more than three but fewer than twenty 1's. What about larger numbers?

Problem Corner

7. In 1990, Shakuntala Devi calculated the seventh root of 170,859,375 before her questioner could copy the numbers in his notebook. Which of these is $\sqrt[7]{170,859,375}$?
(a) 5, (b) 15, or (c) 105?
8. In the game of poker, a "straight" is a set of 5 cards that we can arrange in successive order (for example, 9-J-10-8-Q is a straight, because we can rearrange it as 8-9-10-J-Q). Each card is allowed to be any one of the four suits. What is the probability of being dealt a straight from a normal deck of 52 cards? [Aces count as both high and low cards].
9. To make jello, first add boiling water and stir to dissolve the powder. You could either add cold water right away, wait one hour, and then refrigerate the mixture, or you could wait one hour, add cold water, and then refrigerate the mixture. Which method cools the mixture best?
10. Consider the series $1^1, 2^2, 3^3, 4^4, \dots$. Write down the numerals equaling these terms: 1, 4, 27, 256, ... The terminal digits of these give the sequence 1, 4, 7, 6, ... How does this last sequence continue? Does it repeat itself?
11. The sequence
- $$\sqrt{2},$$
- $$\sqrt{2 + \sqrt{2}},$$
- $$\sqrt{2 + \sqrt{2 + \sqrt{2}}}, \dots$$
- converges to what?
12. Which of the numbers
- $$101, 10101, 1010101, \dots$$
- with alternating 1's and 0's beginning and ending with 1, are prime?



ASSOCIATION FOR
WOMEN IN MATHEMATICS

www.awm-math.org

The Association for Women in Mathematics (AWM) is a non-profit organization founded in 1971. The association sponsors programs and awards to encourage women in the mathematical sciences, including

- Travel grants for women researchers,
- Mentoring travel grants for women,
- Workshops for women graduate students and postdoctoral mathematicians,
- AWM student chapters,
- Noether, Falconer and Kovalevsky Lectures,
- Ruth I. Michler Memorial Prize, AWM-Birman Research Prize, AWM-Microsoft Research Prize and AWM-Sadosky Research Prize.

To learn more about these programs and other AWM activities, please visit www.awm-math.org.