The Proof

Below are discussion questions for the *Nova* episode on Fermat's Last Theorem entitled *The Proof*.

1. What is Fermat's Last Theorem?

2. Several of the mathematicians interviewed mention that Fermat's Last Theorem has no foreseen applications. So why do they find it an important theorem?

3. Do you think that other mathematicians might disagree about the level of importance of this theorem? If so, on what basis?

4. Claude Monet was an impressionist painter who spent much of his creative energy painting one scene over and over again: a bridge over a pond in his own garden. In a clip from this *Nova* episode, one mathematician said, in effect, that mathematical problems are not valuable in and of themselves, but for how much interesting mathematics is generated in the process of solving them. What parallels can you draw between these two observations.

5. Professor Katz was both one of the colleagues in whom Wiles confided regarding his work and also one of the individuals asked to "referee" that work. Explain what you have learned about the refereeing process. What purpose does it serve? Does it seem to be an antagonistic process? a cooperative process?

6. Madeleine L'Engle makes a couple of interesting comments about art in her book *Walking on Water*. In one passage she says:

> I believe that each work of art, whether it is a work of great genius, or something very small, comes to the artist and says, "Here I am. Enflesh me. Give birth to me."

Later she says:

> The artist, too, must be obedient to the command of the work, knowing that this involves long hours of research, of throwing out a month's work, of going back to the beginning, or, sometimes, scrapping the whole thing.

Citing sentiments expressed by Andrew Wiles in this episode, can you support the view that he sees his proof of Fermat's Last Theorem in much the same way as L'Engle views the creation of art?

7. In the previous question the proof of Fermat's Last Theorem is attributed to Andrew Wiles. Is this fair? In what ways were other people involved? Why is the proof attributed to Andrew Wiles?

8. There is a good deal of excitement visible among the mathematicians interviewed for this program. What is so exciting about the proof of this theorem? Are concepts and ideas ever this exciting to you? If so, what kinds of ideas?

9. Toward the end of the program, one of the mathematicians expresses doubts about whether there will be any problems that can take the place of Fermat's Last Theorem. What is the nature of his concern? Is he worried that the number of unsolved problems in mathematics is beginning to dry up?