

5. Consider the number $N = (1 \times 2 \times 3 \times 4 \times 5 \times 6 \times \cdots \times 48 \times 49 \times 50) + 1$
- (a) How can you show that this number is not divisible by 5 **without using a calculator**?
- (b) What do you know about the prime factors of N ?
6. A restaurant offers 7 toppings for its pizzas. How many ways can you order a pizza with two toppings (no “doubles”)?
7. Imagine that you are composing a song, creating a piece of visual art, or writing a short story or poem. Give one example of how you might use the Fibonacci numbers in your work.

8. Determine whether each of the following numbers are prime. If the number is prime, write **prime**. If the number is not prime, explain why it is not prime.
- (a) 247
 - (b) -7
 - (c) 97
 - (d) 2
 - (e) $\frac{5}{7}$
9. Based on the movie that we saw on Wednesday, determine whether each statement is **true** or **false**. Write the entire word **true** or **false**. You will receive no credit for just T or F.
- (a) In the margin of his book, Fermat wrote *Demonstrationem mirabilem ... Hanc marginis exiguitas non caperet*, meaning he has a truly wonderful proof, but the margin is too small to contain it.
 - (b) Andrew Wiles tried to keep it a secret from most other mathematicians that he was trying to prove Fermat's Last Theorem.
 - (c) After the proof was delivered as a lecture at a conference in Cambridge, Andrew Wiles and his colleagues were deluged by inquiries from newspapers and journalists from all around the world.
 - (d) The Japanese mathematicians Taniyama and Shimura challenged Andrew Wiles to a duel because they thought he stole their idea.
 - (e) The final version of Andrew Wiles' proof of Fermat's Last Theorem was just two pages long.

10. Estimate the total amount of time that 19-year-olds in the United States spent studying for college exams in Fall 2006. (There are 300,000,000 people in the United States.)
11. A college football team lists its players' heights on the roster, representing each height in feet and inches, to the nearest whole inch (no fractions). There are 118 players on the team. Explain why you are absolutely certain that there are two players with the same height (as listed on the roster).
12. What does Fermat's Last Theorem say about equations of the form $x^n + y^n = z^n$ where x , y , and z are natural numbers?

OPTIONAL Survey Question:

What math class did you take in Fall 2006?

- (a) I did not take math.
- (b) Math 113
- (c) Math 115 (Statistical Reasoning)
- (d) Math 119 (College Algebra)
- (e) Some other math class: _____