

1.6.1

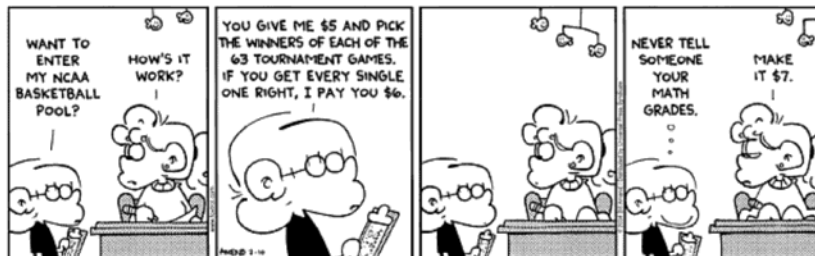
Friday, February 3, 2017 5:54 PM

Reminder: A **conjecture** is a conclusion based on examples.

We know that **inductive reasoning** can lead to a conjecture that may be proven by **deductive reasoning**. However, conjectures may be false, and can be disproven by a **counterexample**.

Example 1: Decide whether the process used is inductive or deductive reasoning:

- a. Show the sum of two even numbers is even by using several examples.
 $2+4=6$
 $8+14=22$ *Inductive.*
- b. No mathematician is boring. Ann is a mathematician. Therefore, Ann is not boring.
no examples → statements = deductive
- c. One counterexample proves that a conjecture is false.
deductive
- d. You show why your statement makes sense *algebraically*.
deductive
- e. You give evidence that your statement is true.
inductive
- f. Six other examples to show that your conjecture is true.
inductive
- g. What three coins have a value of \$0.60?
deductive
↳ didn't ask for examples.
→ one possible way.



Example 2: Al, Bob, Cal, and Dave are on four sports teams.

- Each play on just one team.
- They play football, basketball, baseball, and hockey.
- Bob is a goalie.
- The tallest player plays basketball, and the shortest baseball.
- Cal is taller than Dave, but shorter than Al and Bob.

What sports does each play?

Draw Table to help

Al ← Cal ← Dave
Bob

∴ Al plays Basketball.
Bob plays Hockey.
Cal plays football
Dave plays Baseball.

	Foot	Basket	Base	Hockey
Al	X	✓	X	X
Bob	X	X	X	✓
Cal	✓	X	X	X
Dave	X	X	✓	X

Example 3: Art, Bill, Cecil, and Don live in the same apartment. They are a manager, teacher, artist and musician. Art and Cecil watch TV with the teacher. Bill and Don go to the hockey game with the manager. Cecil jogs with the manager and teacher. Who is the manager?

	Manager	Teacher	Artist	Musician
Art	✓	X		
Bill	X			
Cecil	X	X		
Don	X			

∴ Art is the manager.

Assignment: pg. 48 #1, 3, 5, 6, 8, 9, 10, 13, 16

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optional