

UNDERSTAND THE PROBLEM:

A ROUND ROBIN TOURNAMENT IS ONE WHERE EACH TEAM PLAYS THE OTHERS ONCE. HOW MANY GAMES ARE PLAYED FOR DIFFERENT NUMBERS OF TEAMS.

MAKE A PLAN:

EXPRESS THE RELATIONSHIP USING A TABLE, A FORMULA, A GRAPH, AND A COMPLETE ENGLISH SENTENCE. LOOK FOR ANY PATTERNS THAT ARE FORMING.

CARRY OUT THE PLAN:

# TEAMS	# GAMES
1	0
2	1
3	3
4	6
5	10
6	15
7	21

* THE INCREASE IN NUMBER OF GAMES FOR EACH INCREASE IN TEAMS SHOWS A RECURSIVE PATTERN

IT LOOKS LIKE THE CHANGE IN THE NUMBER OF GAMES IS INCREASING BY ONE MORE EACH TIME WE INCREASE THE NUMBER OF GAMES BY ONE.

DIFFERENCE EQUATION:

BY LOOKING AT THE TABLE WE CAN SEE THAT THE NEXT NUMBER OF GAMES CAN BE DETERMINED BY ADDING THE CURRENT NUMBER OF GAMES AND THE CURRENT NUMBER OF TEAMS.

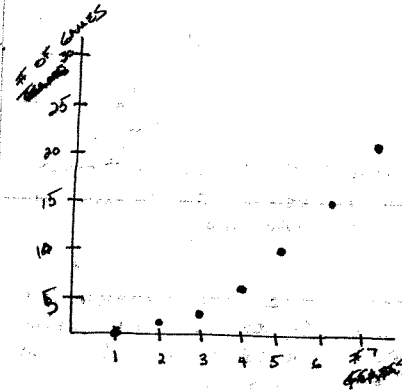
DEDUCTIVE REASONING:

FOR DETERMINING THE NUMBER OF GAMES HERE WE NEED ANOTHER FORMULA. AT FIRST WE GUESSED THAT WE COULD MULTIPLY THE NUMBER OF TEAMS (n) BY THE NUMBER OF TEAMS MINUS ONE ($n-1$). THIS CONSISTENTLY GAVE US NUMBERS DOUBLE WHAT WE WERE LOOKING FOR. THIS IS WHEN WE DETERMINED WE NEEDED TO DIVIDE THE ENTIRE EQUATION BY ONE HALF.

THE FORMULA SHOULD BE

$$G_n = \frac{1}{2} n(n-1)$$

LET: G_n = # OF GAMES FOR n -TEAMS
 n = # OF TEAMS



THE LINE ON THE GRAPH APPEARS TO BE INCREASING @ AN INCREASING RATE.

D. THE NUMBER OF GAMES CAN BE DETERMINED BY MULTIPLYING THE NUMBER OF TEAMS (n) BY THE NUMBER OF TEAMS MINUS ONE ($n-1$), ALL DIVIDED BY ONE HALF.