Tues_01_18

Thursday, January 20, 2022 10:50 AM

Chapter 1

1.1 Solving problem by Inductive Reasoning

Inductive Reasoning

Making a conclusion (conjecture) from repeated observations of specific examples

(The conjecture may/may not be true)

Deductive Reasoning

applying general principles to specific examples

Example

Use inductive reasoning to determine the probable next number in the list

(1)

(a) 5, 9, 13, 17, 21, 25, 29, $\boxed{33}$

(b) 1, 1, 2, 3, 5, 8, 13, 21, $\boxed{34}$

(2) predict the next multiplication fact in the list

$37 \times 3 = 111$

$37 \times 6 = 222$

$37 \times 9 = 333$

$37 \times 12 = 444$

$\boxed{37 \times 15 = 555}$

3.

$9 \times 1 = 09$

$9 \times 2 = 18$

$9 \times 3 = 27$

$9 \times 4 = 36$

$9 \times 5 = 45$

$9 \times 6 = 54$

$9 \times 7 = 63$

$9 \times 8 = 72$

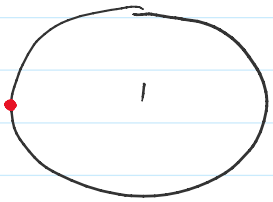
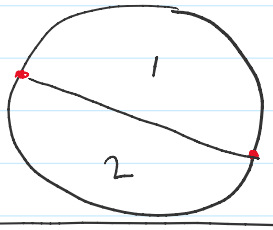
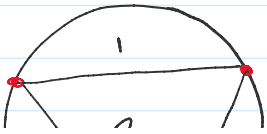
$9 \times 9 = 81$

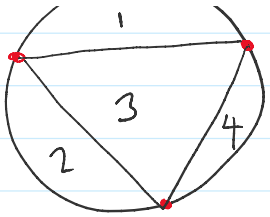
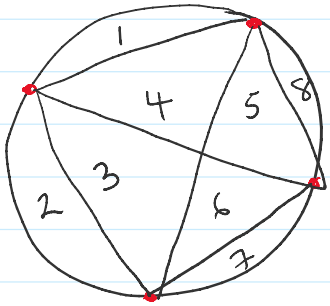
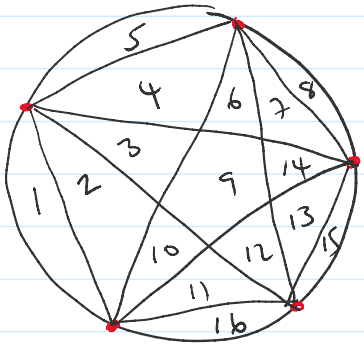
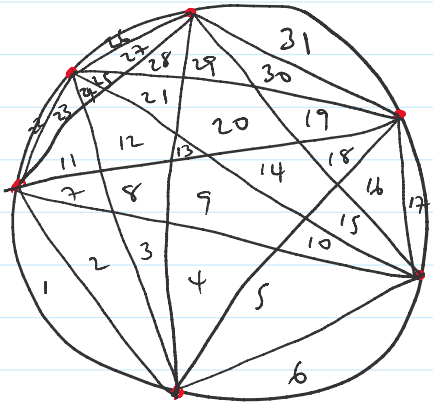
$9 \times 10 = 90$

Inductive Reasoning is not without pitfalls

Consider the following example

Finding the maximum # of regions formed when chords are constructed in a circle

# of Points	# of Regions	
1	1	
2	2	
3	4	

3	4	
4	8	
5	16	
6	31	
7	□	?

Inductive Reasoning suggest 32 regions, but we found 31 regions when we draw chords using 6 points on the circle

Question

How many number of regions in a circle if we use 7 points

Answer

Consider the list

1, 2, 4, 8, 16, 31, ☐

Example of deductive Reasoning

1. All men are mortal, Socrates is a man
   Therefore Socrates is mortal

Classwork

1. Determine the most probable next term in each of the following list of number

(a) 1 3 5 7 9 ☐

(a) $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}, \frac{9}{10}, \boxed{\frac{11}{12}}$

(b) $\frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \frac{9}{11}, \boxed{\frac{11}{13}}$