Exercise 1.1

Use the deductive reasoning to answer the given questions,

1.Predict the next number in each given set of numbers.a. 3,6,9,12,15?

answer: 18

b. 1,3,6,10,15?

answer :21

2. What type of reasoning did you apply in a 1a and ab?

answer: Inductive reasoning

3.Tell whether the mathematical statements is TRUE or FALSE.If false ,provide a counterexample.Assume x is any real number.

a, If x>0 the 1>0. answer: True

x

b. The multiplicative inverse 1 always exists. answer : true

c.x2 is always positive. answer: True

4. In a neighborhood of engineers, it is known that there is a chemical engineer, civil engineer, mechanical engineer, and a electrical engineer among Tito, Vic, Joey and Willy .Identify the correct profession of each engineer given the following clues;

i. Vic gets home from the work after the civil engineer but before the electrical engineer.
ii. Joey. who is the last to get home from work, is not the electrical engineer.
iii. The electrical engineer and Joey leave for work at the same time.
iv. The civil engineer lives next door to Willy.

answer:

Tito is the civil engineer.
Vic is the mechanical engineer.
Joey is the chemical engineer.
Willy is the electrical engineer.

5.A new baby band composed of four young boys John, Jude, Benedict ,and Francis was formed by a recording agency. With one acting as the lead vocalist ,each of the role other boys takes care of the drum, the keyboard, and the guitar. Based on the clues specified below, identify the role of each member in the band.

i. Francis is younger than vocalist.
ii. Josh and the guitarist are twins and they are the youngest member of the band.
iii. Benedict and the guitarist are schoolmates.

answer:

Francis is the drummer.
Jude is the guitarist.
Josh uses the keyboard.
Benedict is the vocalist.

Exercise 2.1

Solve each problem using Polya's four step problem solving strategy.

1. The elimination stage of the UAAP's women's volleyball competition is played in two rounds where each competing team plays against each of the other tea

ms once in every round. How many games are played in the elimination round if there are eight teams in a given season?

Answer:

8P2=n!/(n-r)!=8!/(8-2)!=56 games

2. Find the digit that is 50 places to the right of the decimal point in the decimal representation of the rational number.

Answer:

It is to note that the pattern in the decimal sequence repeats after every 3 digits.

In the decimal representation of a rational number, wh

en looking at the 50th digit to the

right of the decimal, it is noticeable that the previous number of it is divisible by 3, meaning the number after the 3rd digit is the same as the 50th digit.

3.

A coffee shop is giving away a signature annual planner. In the mechanics, each customer has to collect 24 stickers to avail of the said planner, and customers can share stickers. At the end of the promo period, Tito had the greatest number of stickers, more than enough to get the planner. Unfortunately, Vic and Joey did not have enough. This is wha

t they did: First, Tito gave

Vic and Joey as many stickers as each had; after this Vic gave Tito and Joey as many stickers as many as they had. At the end, each of the three friends had exactly enough stickers to get a planner. How many stickers did each p

erson have at the start?

answer:

Tito: x=39 stickers

Vic: y=21 stickers

Joey: z=12 stickers

4. Iza can earn ₱7,800.00 for doing 3 hours of office work and 2 hours of field work. However, she

gets ₱8,200.00 if she works two hours in the office and 3 hours in the field. What is the rate per hour of Iza for doing office work and fo

r doing field work?

Answer: Iza gets paid ₱1,400.00 for every office work hour and ₱1,800.00 for every field work

hour

5.Ed's pursue some 10-peso,5-peso,1-peso, and 25-centavo coins.How many of each type does he have if the purse has a total of P.20.50?

10.00	5.00	1.00	.25	
1	1	5	2	
1	1	4	6	
1	1	3	10	20.50
1	1	2	14	
1	1	1	18	

Answer: these are all combinations to which there is at least one type of coin there are in Ed's purse.

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DIAGNOSTICS

Instructions: Provide the information asked in the following scenario.

1. Consider a 10-item true or false question.
   _____a. In how many ways can you answer the first item?
   _____ b. In how many ways can you answer the first 2 items?
   _____c. In how many ways can you answer the first 3 items?
   _____ d. Generalizing ,in how many ways can you answer the first items?
   _____ e. In how many ways can you answer the 10-item test?
2. In a certain gathering,participants greet each other through handshakes.Of course, a person cannot shake his own hands and each person can only shakes hand with another person once.

1 a. How many handshakes occurred between two people in meeting?
3 b.How many handshakes occured among three people in the meeting/
6 c. How many handshakes occurred among four people in the meeting?
78 d. If there are 12 people in the meeting,how many handshakes occurred in all?
n(n-1) e. What formula can be formed to compute the total number of the handshakes if there are n people in the
2 total number of the handshakes if there are n people in the meeting

EXERCISE 3.1

Solve the ff. problem using Polya's four-step problem-solving strategy.

1. In the complex number system i1=i2,-i3=-i4=-i5=i……Find i173?
   answer: 173 / 4 = 43 remainder 1. This means that i173=i1=I or 172 is 1 therefore 173 is i.

2. Find the last digit of the sum :32018+42018
   answer: 2018 / 4 = 504 remainder 2. This means that 32018 / 2 = 1009. Since there is no remainder, the exponent is equal to the period for 4n.

   42018=42=16.The last digit is 6
   Finding the sum, 9 + 6 = 15.

3. Yan was born exactly 78 days before Dong was born .If Dong was born on a Monday,what day was Yan born?
   answer:

   It was a Sunday, 78 days from when Dong was born.
   Therefore, Yan was born on a Sunday.

4.The set of The set {0,1} forms the binary system. There are exactly two 1-

digit binary numbers, namely 0 and
1; there are four 2 digit binary numbers, namely 0 and digit binary numbers, namely 0 and
1; there are four 2 digit binary numbers, namely 00, 01, 10, and 11; and there are eight 3 digit binary
numbers, namely 000, 001, 010, 100, 011, 101, 011, and 111.

0000	1000
0001	1001
0010	1010
0011	1011
0100	1100
0101	1101
0110	1110
0111	1111

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5.Consider a rectangle with length l and width w. Now fold it onto two, draw a line In a fold ,and unfold the triangle. Observe that there are now three triangles, two small rectangles, and the original rectangle.

a. a3= x = 3(3+1)/2 = 6
b. a4=x=4(4=1)/2=10
c. an= x = n(n+1)/2

6. Finding the odd. In a grocery store. Perla was challenged by a promo girl to identify which pack in a box of 25 packs of a liquid detergent is heavier than the rest. According to the promo girl, all packs in the box weigh the same except for the other one which is heavier than the rest. Using only a balance scale. Perla was challenged to identify the single heavier pack for a maximum of three (3) weighting attempts only. If she succeeds, she gets the box for free. How should Perla weigh the 25 packs to successfully identify the heavier pack?
ANSWER:
To find the heavier one, we can compare any two box, leaving the third out. If the
two box weigh the same, then the heavier box must be one of those not on the balance.
Otherwise, it is the one indicated as heavier by the balance.

7.Can Perla succeed in the challenge Refer to number 6) if there are 30 packs in the box with 29 having the same weight and (1) one that is heavier? Explain your answer.
ANSWER:
Perla cannot 100% succeed since that the total pack is 30. By using the formula,
3
$3 = 27$, which is the total amount of packs that can give a 100% chance of winning. Thus,
30 packs is out of range of achieving a 100% chance of winning

8. John bought ten (10) bottles of Vitamin C tablets(same brand)from a certain pharmacy .After getting home ,the saleslady in the pharmacy called and informed him that one of the bottles is a complete counterfeits (meaning,9 bottles contain all counterfeit items).He was told that the real medicines weigh 10mg each tablet while the counterfeits are heavier at 11 mg each tablet. Using a digital weighing machine ,can John identify which bottle contain a counterfeit in just (1) weighing attempt?

answer;
The possibility of John identifying which bottle of Vitamin C tablets that contains the counterfeit in just one attempt has a probability of 1/10. A digital weighing machine is used, therefore, only one bottle can be weighed at a time. If by luck, he got the bottle that contains the counterfeit first, he can definitely identify it in just one attempt. However, there are 9 bottles more, thus, if he got all those before the counterfeited one, it would be a total of ten attempts.
John only has a 10% chance of getting the counterfeit bottle.

9. While waiting for their parents to arrive ,Sansa and Arya decided to play the a game.They collected 25 stones and placed it in an urn.They are to take turns taking away 1,2, or 3 stonesfrom urn.The person who will take the last stones loses.Sansa took the first move.What are her chances of winning the game?

answer:
The only sure chance that Sansa will win the game if she is able to leave five stones in the end for Arya to choose from. Arya could get 3 stones from the five, then Sansa could get 2, leaving Arya with the last one; or, Arya could get 2, Sansa would get 2 as well, still leaving Arya with the last one. Another scenario would be that Arya would only get 1, Sansa would get 3, and Arya would still be left with the last stone.

Module 3. Assessment

l. Identify what type of reasoning is applied in the following arguments .Write Inductive or Deductive.

a. I have to review only the topics that Mr , Cruz discussed in the class .My friends who had been in his class said he never gave a test on topics that he never discussed in the class.
   answer; INDUCTIVE
b. Why is Aling Vicky so forgetful? The only reason that I can think of is that she is not getting enough sleep lately. Lack of sleep makes a person forgetful.
   answer: INDUCTIVE
c. Don will make a good president. After all he did great as a mayor.
   answer: DEDUCTIVE
d. The heat outdoors must have triggered my blood pressure to go up. Why not? I had it all normal while I was indoors with the air conditioning on.

3. For young children are seated next to each on a bench. .The child on the left cannot be older than the child on the right .The ages of the 1st and 3rd children differ by 8 years .No child is below 2 years old, neither any of them is older than 10 years old. The 2nd child is 7 years younger than the 4th child. What are the ages of the four children?
   answer:

   .The reciprocal of 7 is a repeating,non-terminating decimal.What is the 12th digit in the decimal form of the reciprocal of 7?
   answer: 1=142857 or 0.142857 142857
   7 999999

4. How many times does the number 5 appear if you write all numbers from 1-200?
   answer:

5. Each letter represents one of the digits 0,1,2,3,4,5,6,7,8,0r 9.The leading digits are non-zero digits. What digits is represented by each letter?
   A
   +BB
   ADD
   answer: The numbers which are represented by the letters A,B,and D represents one of the digits .Each letters A,B, and D represents 0,1,2,3,4,5,6,7,8,or 9 are non-zero digits.