How to Solve a Problem by Identifying its “Puzzle Type”

Presented by

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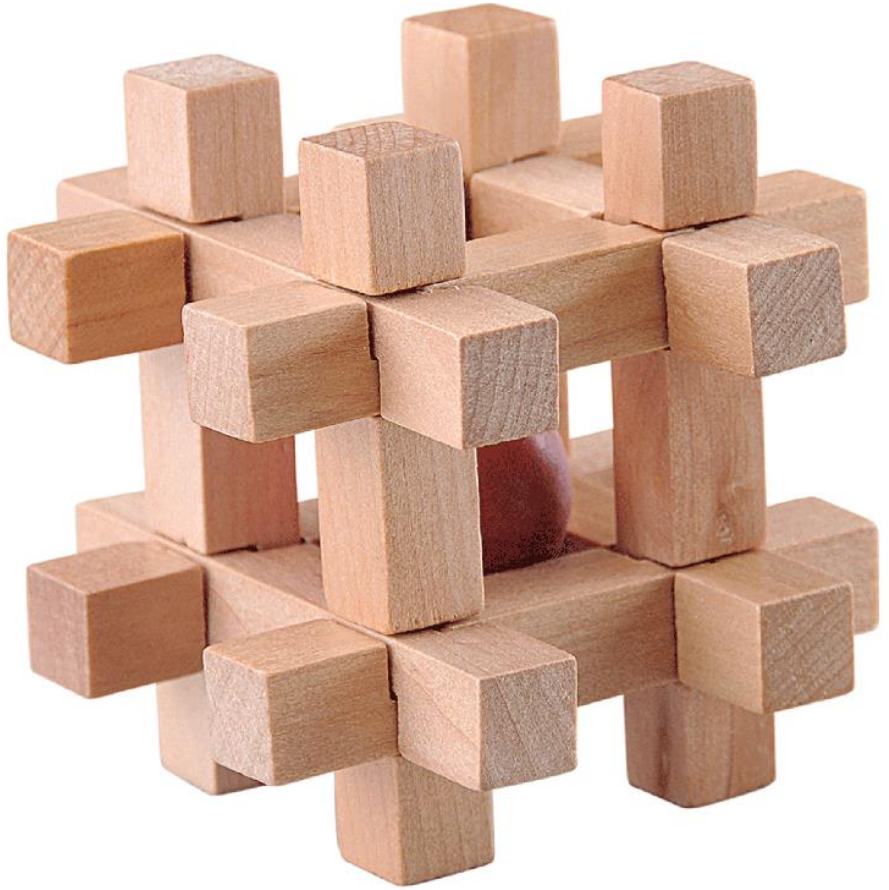

BHS and **Karaz w Laimoon**
are collaborating to give one talk
on each “**Last**” Thursday in the month

Tonight is the first of the **Thursday Talks**

The next talk will be on the 27th of February

“**What Can Happen to Your Eyesight and what Can You Do about it**?”

It will be presented by **Dr. Nada Jabbur** (**AUBMC and CMC**)

The Objective of the Talk is to Classify Problems by “**Type**”

If you can identify a problem’s type, it would be easier to solve.

We face problems in many areas:

- Engineering design
- Mathematics
- Architecture
- Relationships
- Social and emotional problems
- Technological problems
- Puzzles

Solution: Use Puzzles

- We will use "**Puzzles**" to classify problem types.
- They are **simpler** to setup
- They are **easier** to present
- They are **universal** too
- We can then apply these types to other problems

Summary of Puzzle Types

1) Eliminate Information that is not Relevant
2) Change the Perspective of the Question
3) I did not know you could do that
4) Suspect obvious solutions
5) Look for Conflicting Information
6) Look for a Twist in Thinking (Lateral Thinking)
7) Identify Hidden Information
8) AHA and GOTCHA
9) Look for Crazy Patterns
10) Some problems might have NO solution

For subscription to KwL and more details about future talks visit

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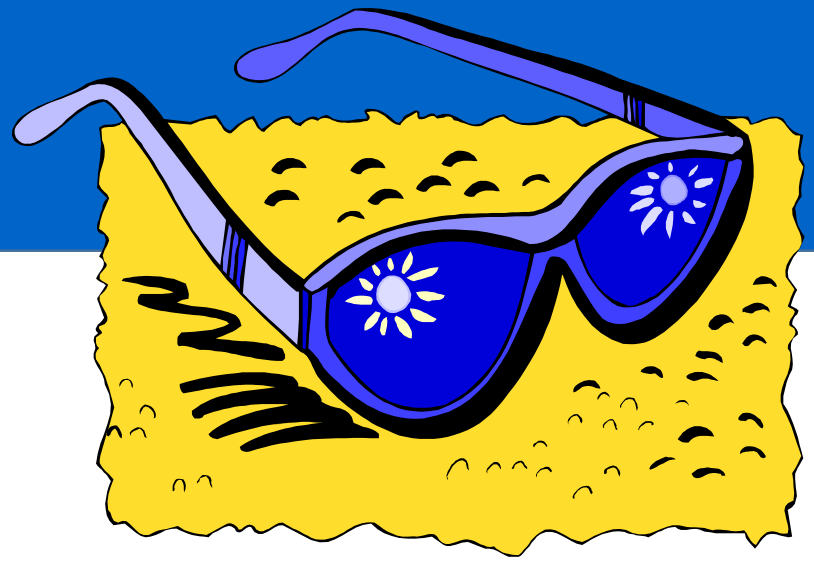
- Problematic situations have a lot of “side” information
- Much of this information will clutter your mind

1

Eliminate Information that is not Relevant

The Fake $100 Note



- A man entered a shop to buy glasses.
- He liked one at $60
- He gave the shopkeeper a $100 note
- The shop had no change
- The shopkeeper changed the $100 at the neighbor’s
- He got 10 notes of $10 each
- The customer took the glasses and $40
- Later, the neighbor came to say that $100 note was **forged**.
- The shopkeeper gave him a valid $100
- **How much did the shopkeeper lose?**

Solution: The Fake $100 Note

- The transaction with the neighbor is irrelevant
- The shop owner got 10 x $10 notes in the morning and gave a piece of paper
- He then gave back a $100 note when the forgery was discovered
- Many people say: $40 and $60 . . . He did not lose $60
- He lost $40 and the **cost of the glasses**

International and US Date Format

- You are working in a company with Americans and others
- People use two date forms **DD-MM-YY** and **MM-DD-YY**
- Some dates are confusing such as **1-5-2020**
- For example, whether we state a date as **17-4-2020 or 4-17-2020**, there will be no confusion,

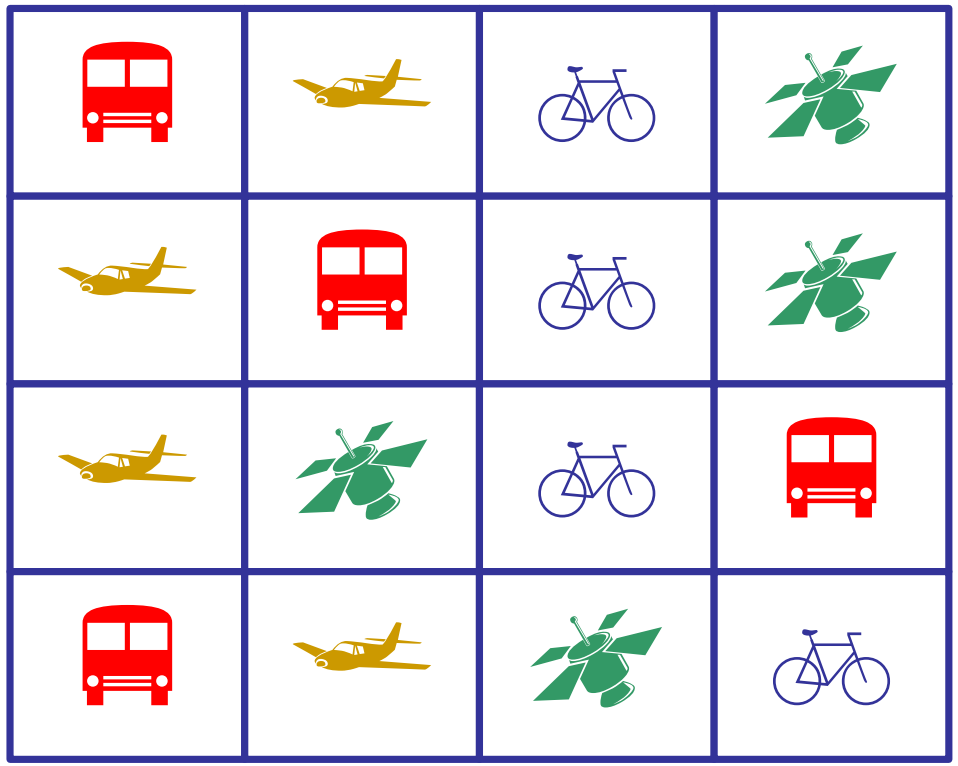
- **How many days in the year are NOT ambiguous?**

Solution: International and US Date Format

- There is a lot of information
- BUT, we know that the first 12 days of each month are confusing: **1-5-2020 and 5-1-2020**
- We have 12 x 12 confusing days
- We therefore have 365 – 144 days = 221 unambiguous days

The Missing Total

- The diagram shows the column and row totals.



				110
				110
				110
				110
90	105	125	?	

- **Find the missing total**

Solution: The Missing Total

- Most people would start to replace values
- An algebraic solution is to be discounted
- All you have to do is add the 4 x 110 in the vertical column
- This is = 440
- You can then find the missing value = 440 – 90 – 105 – 125
- The answer is 120

- Problems and Puzzles tend to focus on a specific question
- Very often, this is the difficulty
- Change the perspective of the question
- Ask it from another side or point of view

2

Change the Perspective of the Question

Husband Meeting Wife on the Road

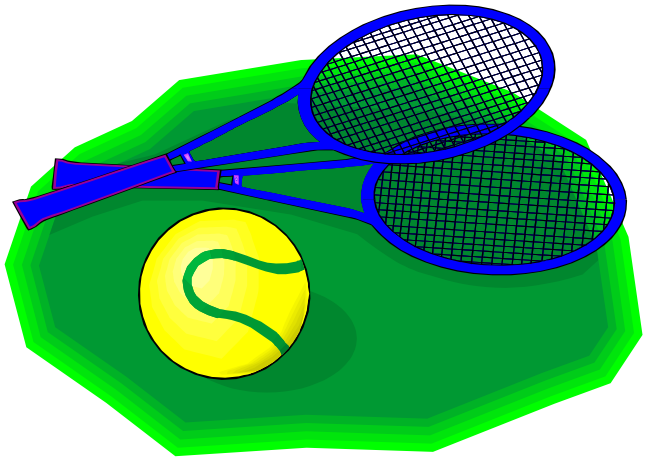
- A man leaves his office everyday at the **same time**.
- His wife drives from home to pick him up.
- She always arrives at his office just as he is leaving it.
- They turn around and head home and reach home **at the same time** every day.
- One day, he finishes work **1 hour earlier** than usual. He walks towards Home.
- After **some time**, he sees his wife driving towards him.
- He flags her down. They turn around and drive back home.
- This time, they get home **30 minutes earlier** than usual.
- **How many minutes did he walk before he met his wife?**

Solution: Husband Meeting Wife on the Road

- We cannot solve the problem from the husband's point of view.
- We do not have much information
- Ask the question differently: how much time did he save her?
- Since they reached home 30 minutes earlier, she **drove 30 minutes** less
- In those 30 minutes, she would have reached his office and returned to where they met
- **Solution**: she met him 15 minutes before their regular meeting time. Since he left office 60 minutes earlier, he walked 45 minutes before meeting his wife

How Many Matches in a Tournament?

1) If 36 players are to play in a tennis tournament, you can find out how many matches are required by drawing the **tournament tree**.
2) Any players left out of a multiple of 2 (4, 8, 16, 32) will play their own matches before reaching 16, 8, 4, 2 matches.



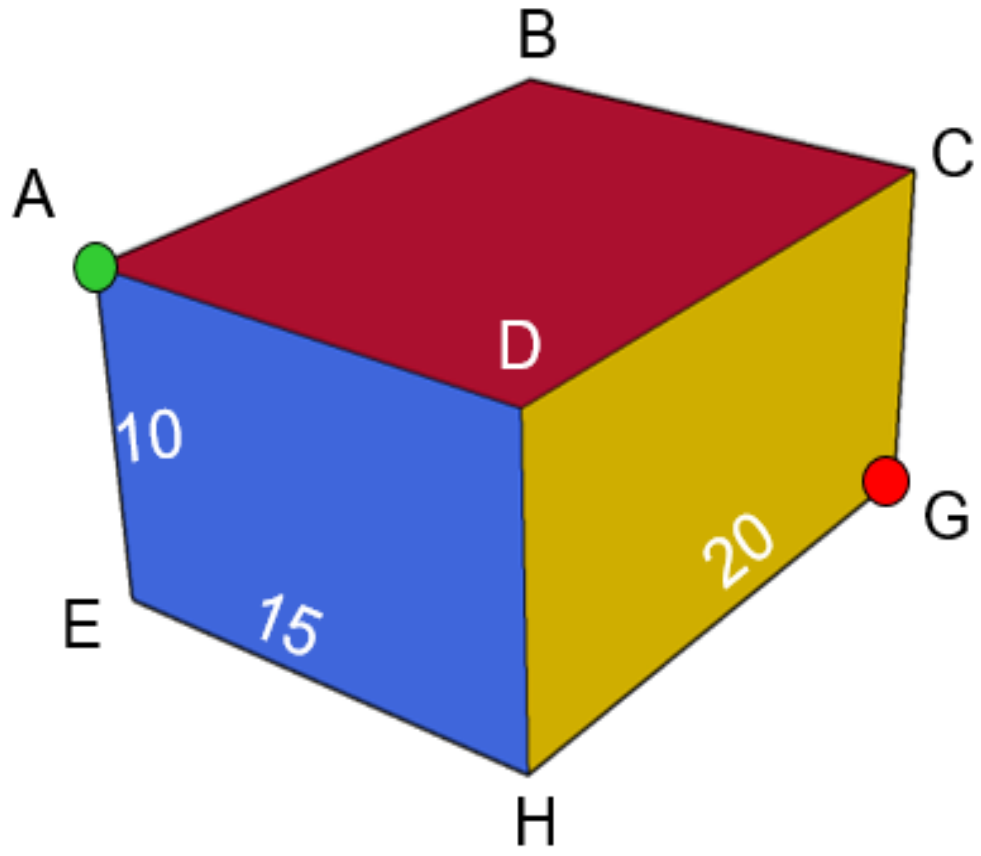
There is a simpler more elegant way to find the answer (without pencil and paper).
And for **any number** of players … what is it?

Solution:
How Many Matches in a Tournament?

- Just switch the question around . . .
- If there are N players, we need to eliminate N – 1
- We need N – 1 matches

The Path of the Spider on a Cube

- A spider is stationed at vertex A on this solid cube.
- It needs to go to vertex G.
- With dimensions as shown, what is the shortest path it can traverse between A and G?
- (Point F is hidden and is below B).



Solution:
No need for formulas . . Just Pythagoras

- Unfold the cube (opposite sides shown with the same color).
- **Shortest path** is either the white diagonal or the black one. Which is shorter?
- The white diagonal is the hypotenuse of the triangle AFG whose sum of square of sides = 30x30 + 15*15 = 1125.
- The square root of 1125 = 33.54.
- The black diagonal is the hypotenuse of the triangle ABG whose sum of squares of sides = 20x20 + 25x25 = 1025.
- This is the shorter path = square root of 1025 = 32.01.
- Some might argue that going down side AE then traversing the diagonal EG is shorter. The diagonal EG is the square root of 15x15 + 20x20 or the square root of 625 which is 25. But 10+25 = 35 which is longer than 32.01.
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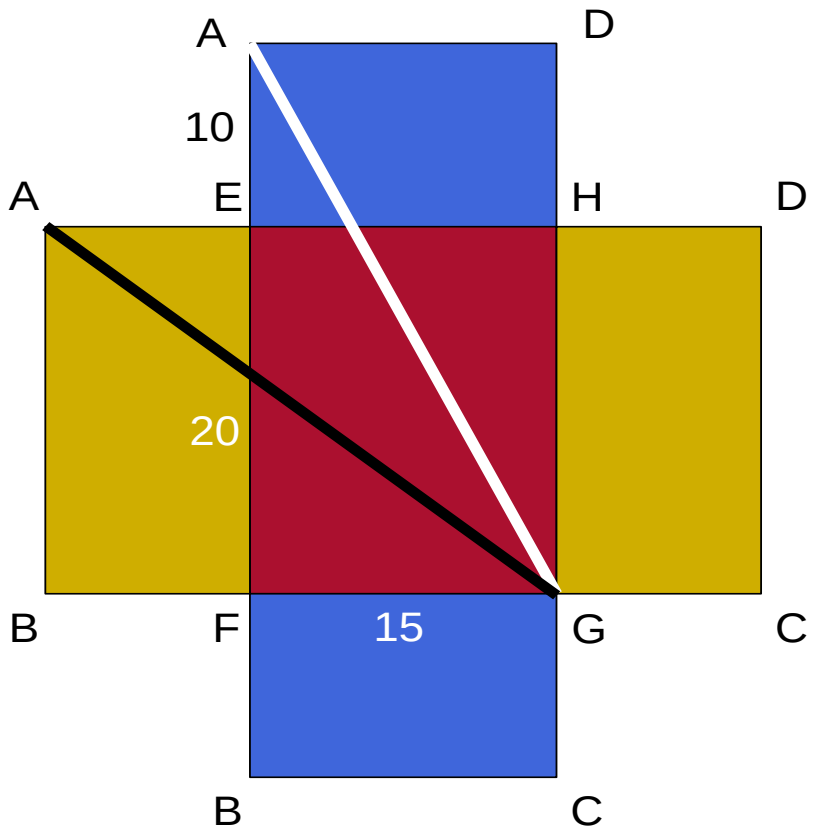
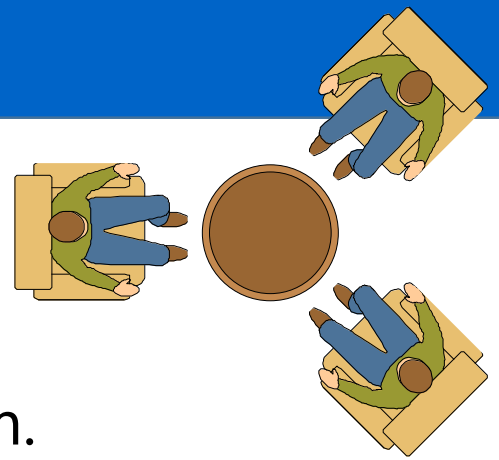


The Intelligent Woman and her Boyfriends



An intelligent woman wanted to marry a most intelligent man.
She had 3 very intelligent boyfriends.

- She sat the 3 men around a round table and blindfolded them.
- She told them she will place a **red** or a **white** hat on each head
- On removing the blindfolds, each man would be able see the other two hats but not his own.
- She said: **if you see at least 1 red hat, you should raise your hand**.
- I will marry the first man to correctly deduce the color of his hat
- She gave them all red hats. They all raised their hands.

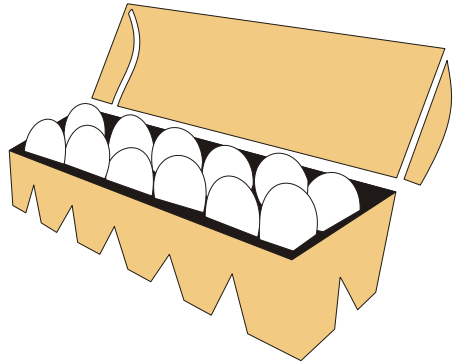
Very soon, one man said, "My hat is red". He was right.
How did he find out?

Solution: The Intelligent Woman and her Boyfriends

- Since all are intelligent, it is assumed they can think fast
- Say Mr. A poses a WHAT IF question
- “What IF my hat were white? What would happen?”
- **Easy**: B would see that my hat is not red.
- He would also see that C raised his hand, so **C must be raising it when he saw my red hat**.
- Being intelligent B would guess his color. (Same with C).
- But A is faster, so he assumed B (or C) are confused, hence his hat is red.

The Egg Seller

- An egg seller told his wife: "**I run out of eggs in the shop**"
- **A buyer said**: I want to buy 0.5 your eggs and 0.5 an egg. I sold him what he wanted.
- Another man came and said the same thing. I sold him what he wanted.
- A third man came along and asked for the same thing. I sold him what he wanted.
- I then ran out of eggs.
- **How many eggs did the egg seller start with before the first buyer came?**



Solution: The Egg Seller

- You cannot work directly
- Change the perspective by starting from the last sale
- The stock at any one time must be an odd number. Otherwise, you will have to break an egg.
- The last quantity sold must be 1 egg: 0.5 the stock, 0.5 of an egg, plus 0.5 of an egg is a whole egg which cleans the egg seller out.
- The next odd number up is 3. That works since 0.5 of the stock (1.5) plus 0.5 gives 2 sold and 1 remaining.
- One up gives us 5, which does not work as 2.5 + 0.5 = 3 eggs, leaving an even number of eggs.
- Solution: **7 eggs**. It will work in three separate sales.

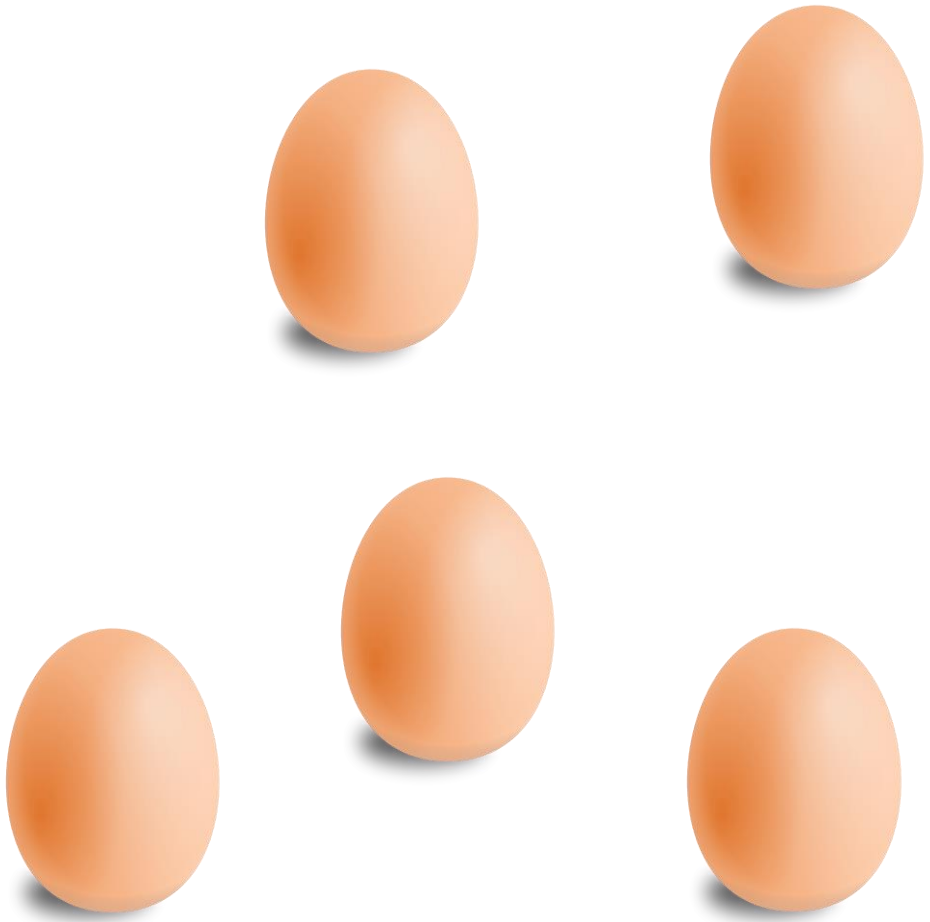
- We are always surprised when the solution asks us to do something we did not expect to do
- Try to find solutions that are not expressed in the statement

3

I Did Not Know you Could do That

Columbus and the Vertical Eggs

- Columbus was tired of being told that finding a New Continent is easy
- Just get 3 ships with prisoners!
- He gave each guest a boiled egg
- He asked them to stand the egg on its wide end without any props and without touching it. They could not.
- **How did you do it?**

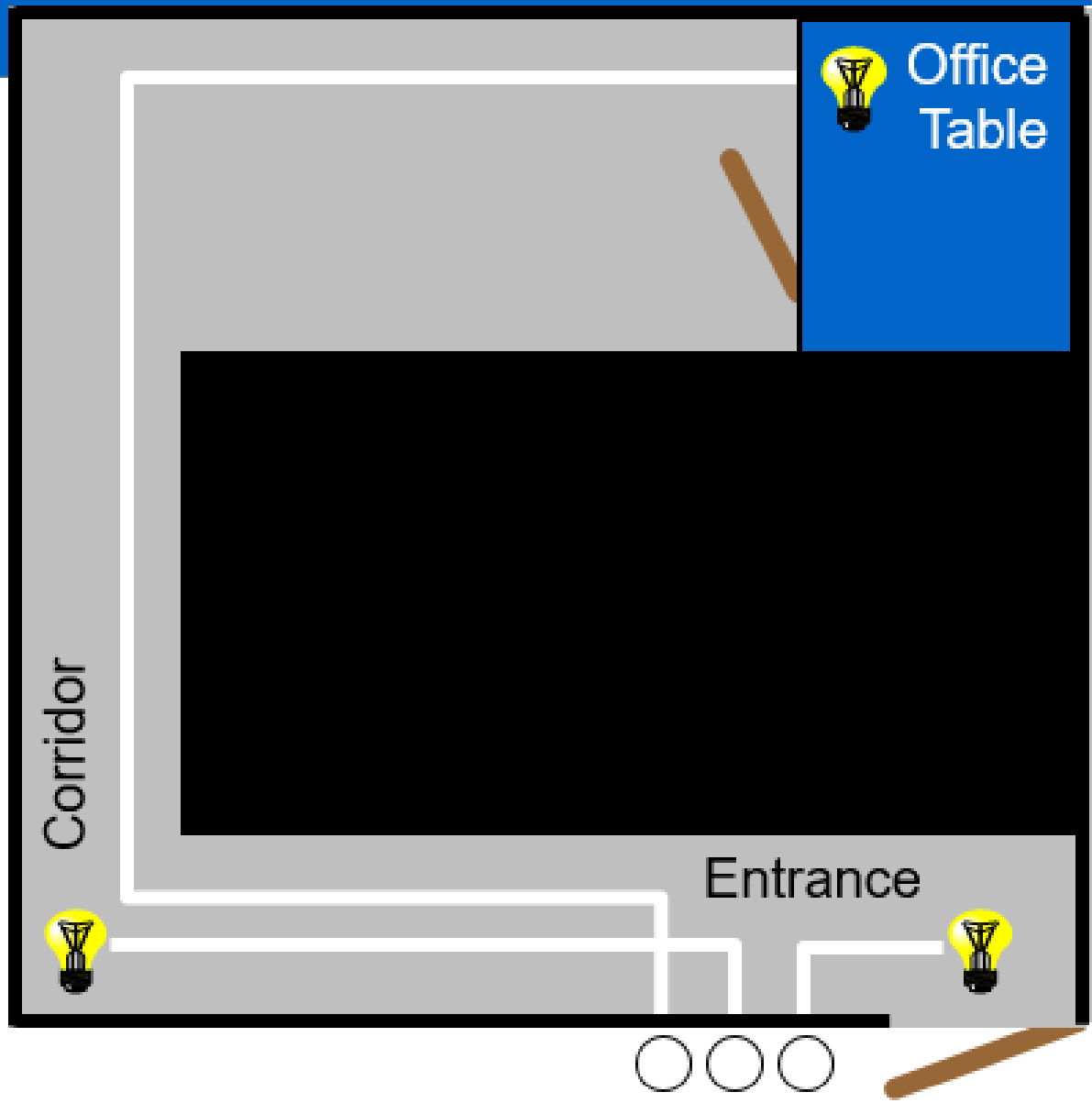


Solution: Columbus and the Vertical Eggs

- Hold the egg and crash it softly on the table
- With the broken bottom, it will be stable and stand up
- The guests shrieked: you did not tell us we can break the egg
- Columbus replied: **I did not tell you not to!**

The Disconnected Bulb

- I have 3 switches next to a door
- 1 = entrance, 1 = corridor, 1 = table lamp in my office
- Electrician set a cable between each lamp and the right switch by the door
- But he only connected the cable of the **Table Lamp** in my office to its switch
- We do not know which switch
- **Task 1**: manipulate the switches the way you want: ONCE
- **Task 2**: visit the office: ONCE
- **How to determine which switch turns the Table Lamp on/off.**



Solution: The Disconnected Bulb

No one told you not to use the heat of the bulb to find out if they were on or not!!

So, the solution is in 3 steps

1) Turn Switch A ON for 5 minutes and then OFF

2) Turn Switch B ON

3) Go to the OFFICE and touch the BULB

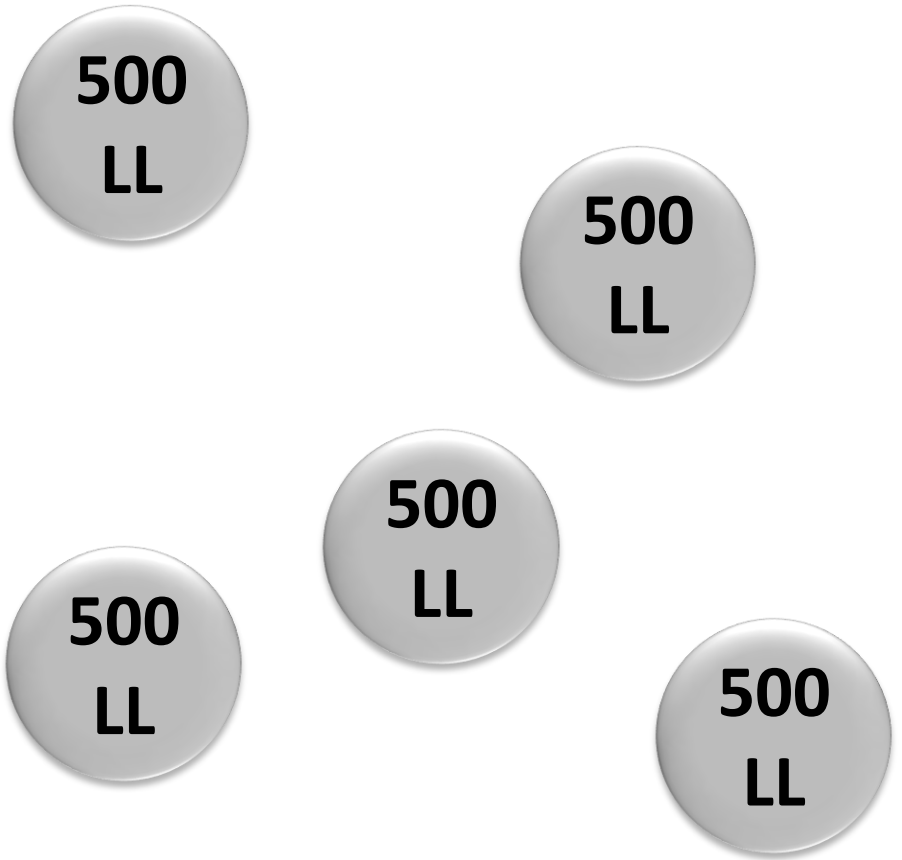
If it is OFF and Cold, it is B.

If it is OFF and warm, it is A

If it is ON, it is C

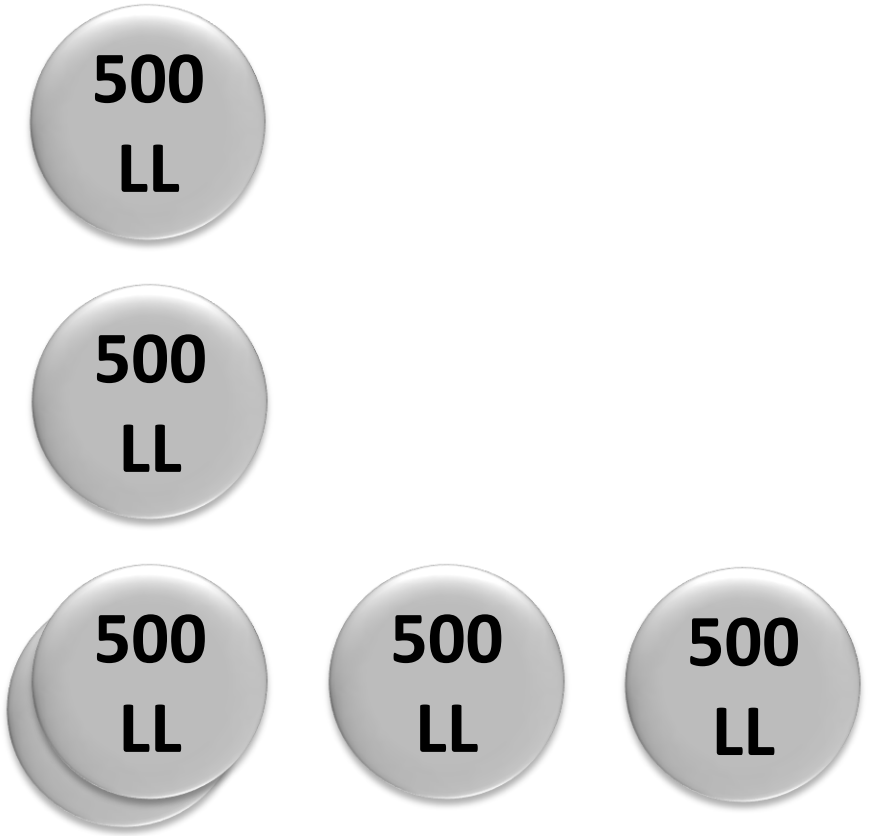
Arrange the 6 Coins

Arrange the 6 coins in in two different **straight lines** so that there are 4 coins in each line.



Solution: Arrange the 6 Coins

- Place two coins in the corner
- This gives you 4 coins in each line



- Most problems have an obvious answer
- If the obvious answer is the correct answer, we would not have a problem!!!
- Suspect the obvious answer
- Chances are it is wrong

4

Suspect the Obvious Solution

Quickies

1) How many times can you subtract 4 from 16?

2) How many cubic meters of soil does a hole have if its measurements are 3 x 2 x 4 meters?

3) How many months have 28 days?

Solution: Quickies

1) The obvious answer is not 4 - - - You can only subtract 4 from 16 once. It then becomes 12.

2) The obvious answer is not 3 x 2 x 4 = 24 cubic meter. Since a hole does not have any soil.

3) The temptation is to say 1: February. In reality, ALL 12 months have 28 days … at least.

A Lilly Growing in a Pond

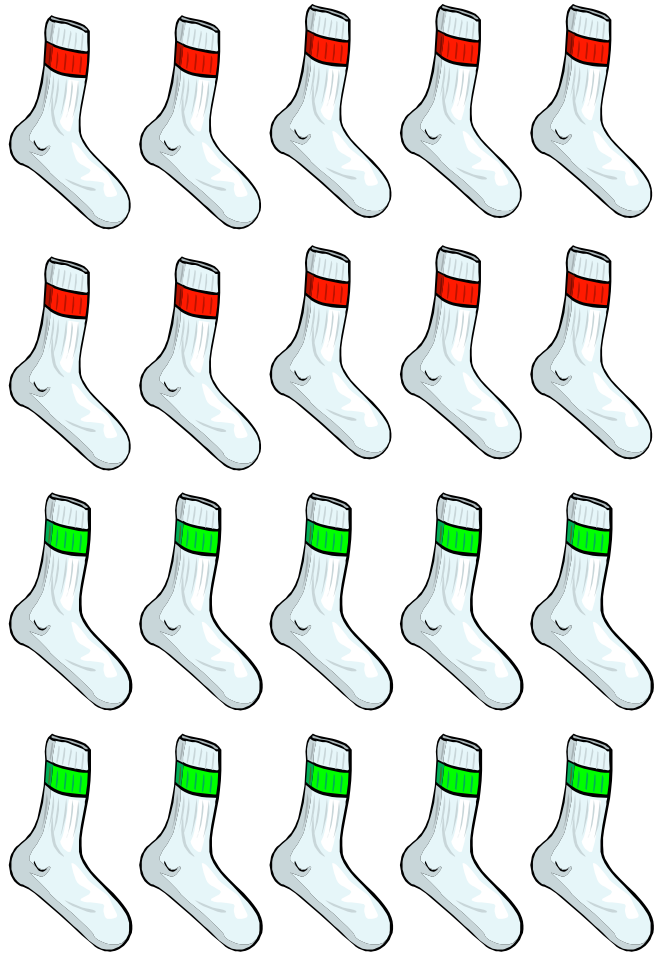
- A Water Lily floats on the surface of a circular pond. As it grows, it doubles its diameter each day.
- If it took the Lily 10 days to cover the whole pond's diameter, **how long did it take to cover half the pond**?

Solution: A Lilly Growing in a Pond

- The answer is not 5 days.
- The answer is 9 days since on the 9^{th} day, it grows double its diameter and covers the whole pond.

How Many Socks to Take Out?

- I have to get dressed in the dark so as not to wake up my wife.
- I pick up my socks from a drawer and take them to the bathroom where I get dressed.
- In the drawer, there are 10 red and 10 green socks.
- **What is the minimum number of socks** I have to draw so that I can be assured that there are at least two of the same color?

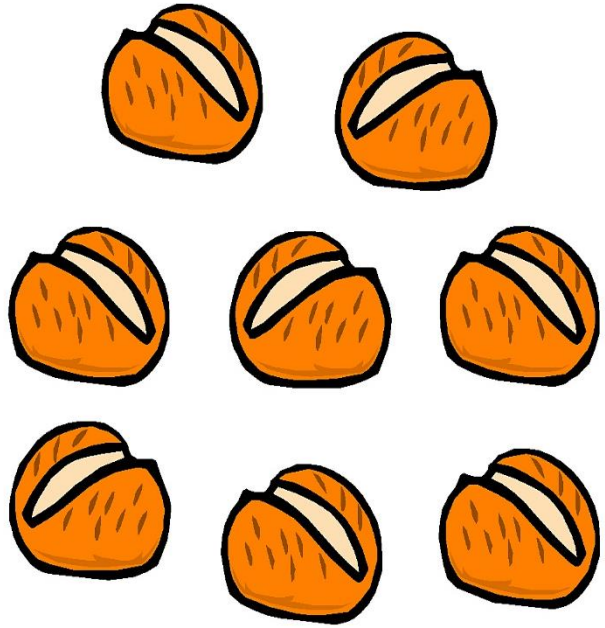


Solution: How Many Socks to Take Out?

- The answer is not 11 . . . 1 over 10
- The answer is 3
- Three socks can be
  - 3 red
  - 2 red and 1 green
  - 1 red and 2 green
  - 3 green
- In all cases, you have enough to wear a matching pair

The Hungry Hunter

- A hunter became hungry and had no food.
- Soon, he met 2 other hunters.
- One of them had 3 loaves of bread while the other had 5.
- They offered to share their loaves with him.
- They divided the loaves equally.
- Our hunter offered to pay for the loaves but he only had $8.
- They managed to divide it fairly.
- **How much did each one get?**

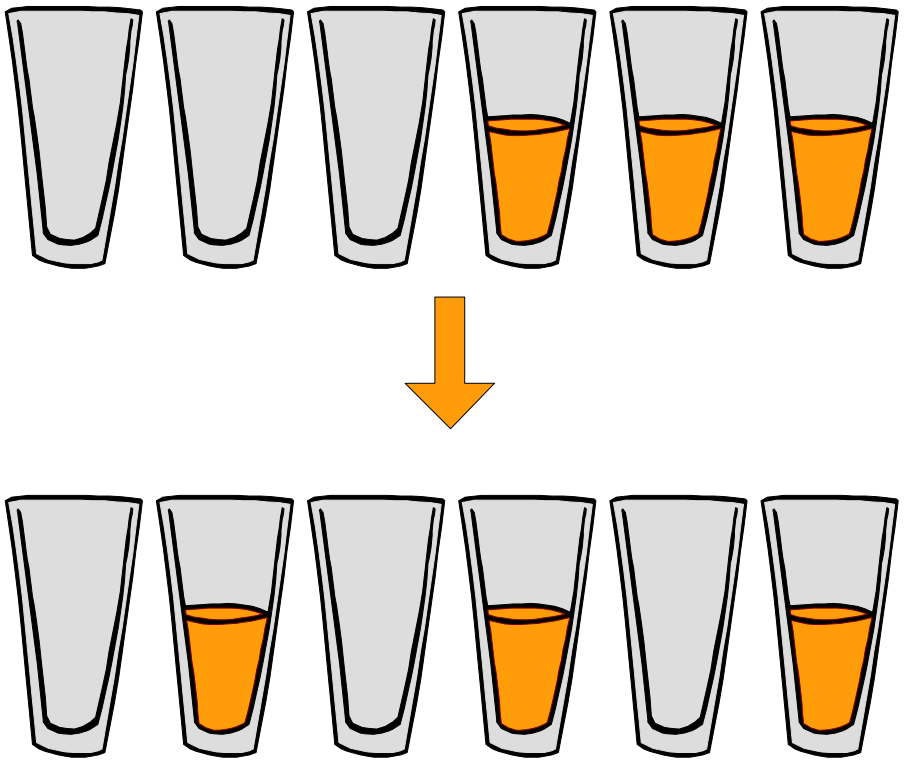


Solution: The Hungry Hunter

- $3 to one and $5 to the other. It's wrong
- The hunters did not contribute equally to the hunter's meal.
- Each of the 3 ate 1/3 of the 8 loaves or 8/3.
- This is equal to 2 loaves + 2/3 of a loaf.
- The hunter's share was 8/3 and he paid $8 so he paid $1 for each 1/3 of a loaf
- The first hunter had 9/3 loaves but only ate 8/3 so shared 1/3 with our hunter who gave him $1
- The second hunter had 15/3 loaves but only ate 8/3 so shared 7/3 with our hunter who gave him $7.

Pouring 3 Glasses into another Three

- In the top row, you start with 3 empty glasses to the left of three glasses filled with orange juice.



- **Can you move only one glass and end up with the pattern shown in the lower row?**

Solution: Pouring 3 Glasses into another Three

- Because the puzzle asked you to “move”, you might not think you can pour.
- Pour the contents of the 5th glass from the left into the 2nd glass from the left

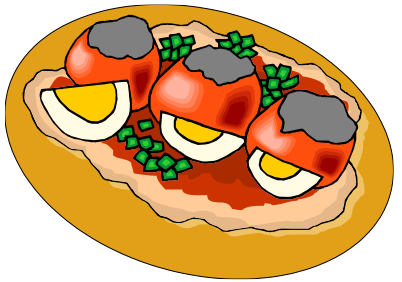
- Some problems have a hidden conflict or paradox
- Look for that “unusual” fact
- You can then solve the problem

5

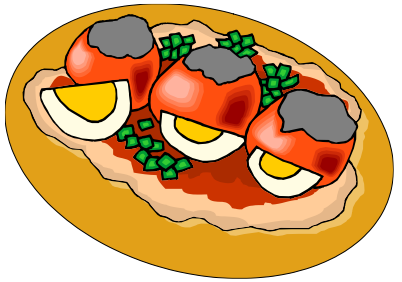
Look for Conflicting Information

The Missing $1

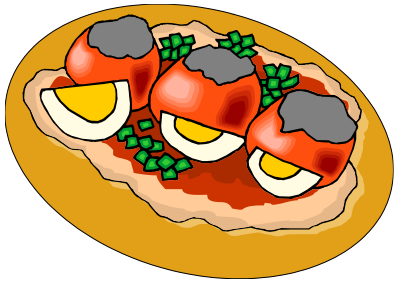
1) 3 customers entered a restaurant.
Each one paid $10 for his meal.
2) As they were getting into their car, the owner of the restaurant saw them from a distance and told the cashier, “**These are my friends, go give them a $5 discount**”.



The cashier took $5 from the cash box.
3) Figuring it would be difficult to divide the $5 into 3, he gave each customer $1. They were happy.



4) Each had paid $9, the total paid was $27. The cashier stole $2, bringing the total to $29.



Where is the missing $1?

Solution: The Missing $1

- In the statement, we added $2 to $27 which is wrong as it is already in the $27

- There are $25 in the cash box
- There are $2 in the cashier’s pocket
- There are $3 with the customers

Where Can you Do this?

- Walk SOUTH one kilometer
- Then walk WEST one kilometer
- Then walk NORTH one kilometer
- And get back to exactly where you started from

Solution: Where Can You Do this?

- Only when you are in the North Pole.

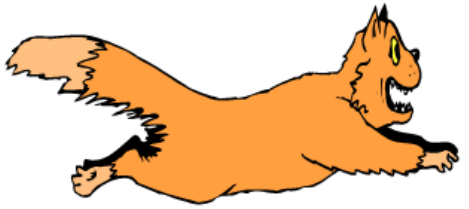
- In some puzzles, the solution can be reached by a twist
- The twist is either in the statement
- OR in the expression of the solution

6

Look for a Twist in Thinking (Lateral Thinking)

The Race between a Cat and a Dog

- A cat and dog ran a race of 100 feet, reach the end and return.
- The cat and the dog can only hop and not run.
- The dog runs in leaps of 3 feet while the cat runs in leaps of 2 feet.
- During the 3 leaps of the cat, the dog leaps 2.
- **Did He or She win?**



Solution: The Race between a Cat and a Dog

- He won . . . .
- The cat leaps 2 at a time can reach 100 and reverse
- The dog leaps 3 at a time and will overshoot 100 by 2 feet and has to return. Therefore, the dog loses . . .
- We think of cats as females and dogs as males, so we are bound to say, **she won** --- but the cat was a male!!
- **He won**

Continue the Series

- 1, 2, 4, 7, 8, 11, 13, 14, 16, 17, 19, 22
- **What is the next number in the series?**

Solution: Continue the Series

- The answer is 46 . . . Here is why
- Start by looking at the numbers that you do not see in the series: 1, 2, 4, 7, 8, 11, 13, 14, 16, 17, 19, 22
- These are: 3, 5, 6, 9, 10, 12, 15, 18, 20, 21
- These are multiples of 3 and of 5
- Therefore, the next number that does not fall in that category is 24
- Add 24 to 22 in the series to get 46

The Sale of Cows

- A man died leaving his 2 sons many cows.
- They sold the cows and were surprised to find that the price per cow was the same as the number of cows they had inherited.
- The buyer gave them one check for the whole amount.
- When they presented the check to the teller in their bank, they requested him to give them as many $10 notes as possible with the rest in $1 notes.

(Continued)

The Sale of Cows (Continued)

- The older brother held the pad of $10'a and started distributing them.
- He first gave himself a ten.
- Then he gave his brother a ten and then himself, and so on, until the tens were totally distributed.
- The last ten happened to be his, so to make things fair, he gave all the one dollar notes to his brother plus **a check**.
- **What was the amount on the check?**

Solution: The Sale of Cows

- The total value of the sale was a square number X^2
- We have an odd number of 10s
- The number of 10s was more than 1 (at least 3)
- If we look at the squares that are have an odd number of 10s, we get
- 16, 36, 96, 256, 576 and so on --- all end in 6
- But 6 is the number of $1 which the younger brother got
- Most people would say the check was for $4 … in reality, it should be half the difference, i.e., $2

The Path of the Bookworm

- I have 5 books on my shelf.
- A book worm got stuck inside Book 1 (left most on the shelf) on page 1.
- It started eating its way from the that page up to the last page of book 5.
- Each book has a thickness of 4 cm and each cover has a thickness of 0.5 cm
- **How far did the bookworm travel?**

Solution: The Path of the Bookworm

- A quick solution would result in the bookworm traversing 5 books less the two outside covers making the total distance = 5 x (0.5 + 4 + 0.5) – 2 x 0.5 = 24 cm. This is wrong.
- Page 1 of book 1 is on the right side as you face the bookshelf. The book was closed on the bookworm when it was on page 1.
- Therefore, to travel through the other books, it would not traverse book 1. It would only traverse the front cover of book 1.
- The same logic applies to book 5. The last page of book 5 is on the left side, which means that when the bookworm reached it, it did not traverse the pages of book 5 nor its front page.

Solution: The Path of the Bookworm (Cont.)

- So the total distance is 3 full books (books 2 to 4) which is 3 x 5 = 15 plus the total width of the front cover of book 1 and the back cover of book 5 which is 1.0 cm.
- The answer is therefore 15 + 2 x 0.5 = 16 cm.

- Many problems have hidden information
- Find it and you can save yourself a lot of trouble

7

Identify Hidden Information

The Unfair Visitation

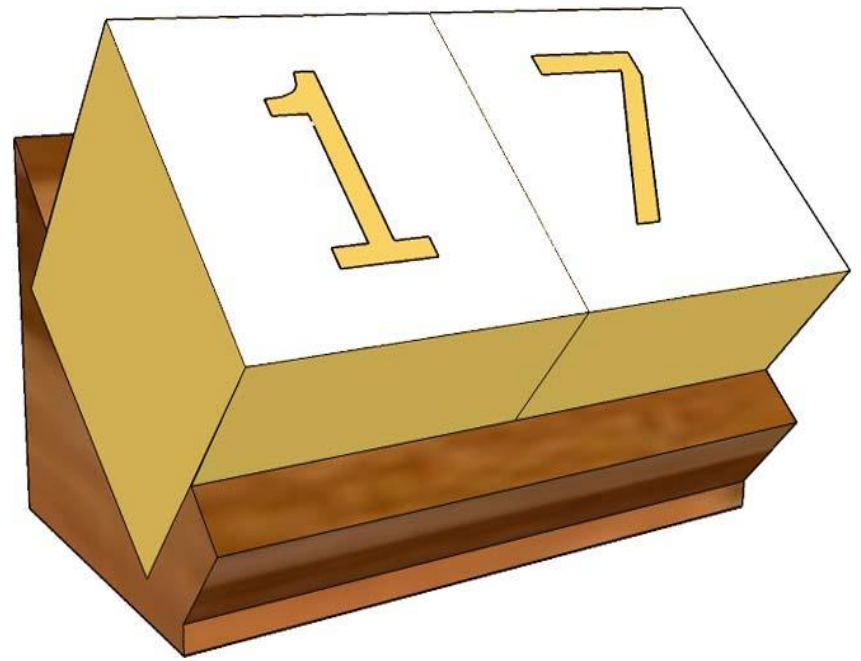
- Jane has two boyfriends whom she visits on different occasions.
- One lives on the east side of town, the other on the west.
- When visiting one, Jane goes to her train station and waits on the platform.
- She arrives at the platform at random times.
- The platform provides access to the two trains: going east and going west.
- Jane takes the **first train that comes along**. If it is going east, she sees her east side boyfriend, otherwise, she sees her west side boyfriend.
- The trains going east or west come once every 10 minutes.
- After a while, Jane realized that she'd been seeing her east side boyfriend 9 times more frequently than her west side boyfriend. How is that possible when the frequency of the trains is the same?

Solution: The Unfair Visitation

- The reason for the bias is each train on its own arrives at equal intervals of 10 minutes each. However, the two trains do not arrive at equally spaced intervals!
- The first East-West train. Say it arrives at time 0. At time 1, a West-East train arrives. 9 minutes later, at time 10, another East-West train arrives. Then 1 minute later, at time 11, another East-West train arrives . . . . Since our lady arrives at the platform at random times, she has a lower probability of catching the West-East than the East-West train. In fact, the chance is 1 to 9 (or 1 in 10).
- This explains why over a long time, she ended up seeing her boyfriend in the West 9 times more often than the one in the East.

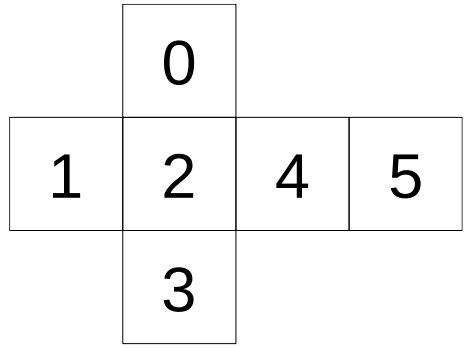
The Desktop Calendar

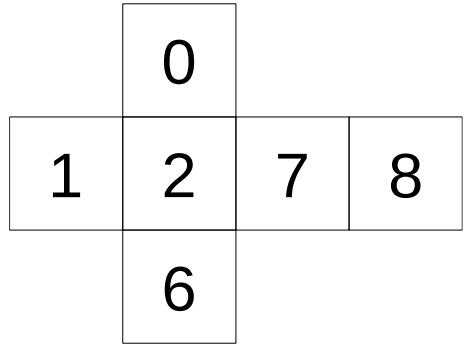
- This is a calendar made up of 2 cubes
- Each day, you change the cubes around to form the new day of the month: 1 to 31.
- Each face can only have 1 digit (12 faces).
- The two cubes must be able to display the all days 01, 02, 03, 04, 05, 06,....., 27, 28, 29, 30, 31.
- What digits must go on each face of the two cubes?



Solution: The Desktop Calendar

- You need to have 0, 1 and 2 on both cubes leaving you with 6 surfaces to fill on each cube.
- We need both 1's to show 11 and 2's to show 22.
- We also need 0 on both cubes so we can show 01 to 09 as well as 10, 20 and 30.
- We also have to show the 7 digits 3, 4, 5, 6, 7, 8 and 9 but are now left with only 6 surfaces.
- So how to solve this problem? **The number 6 can be used to represent 9 when it is upside down**.





Can you name this . . .

Can you name 3 consecutive days without mentioning Sunday, Monday, Tuesday, Wednesday, Thursday, Friday or Saturday?

Solution: Can you name this?

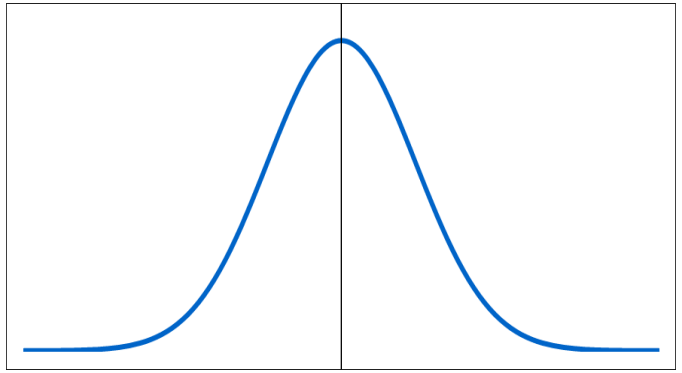
- Hidden information: you can use other days
- Yesterday, today and tomorrow.

- Problematic situations have a lot of “side” information
- Much of this information is useless
- It would clutter your thinking
- Identify all information in the problem
- Eliminate the information that is of no use

AHA and Gotcha

The Genius of Gauss

- Gauss was a German mathematician.
- The Bell shaped curve is the Gaussian Curve.
- When he was seven years old, sitting in class, the teacher had to visit the toilet.
- She gave the students this puzzle to keep them busy: add up all the numbers from 1 to 100.
- By the time she reached the door, Gauss gave out the answer.
- **How did this genius do it?**



Solution: The Genius of Gauss

- He simply noticed the symmetry of numbers:
- 1 to 100, 2 to 99 and 3 to 98 and 4 to 97
- Each pair summed up to 101
- And there were 50 pairs
- It was easy for Gauss to multiply 50 x 101 = 5050

Flipping Coins under a Table Cover

- Someone has laid 200 coins on a table and covered them with an opaque table cover.
- The coins show 20 tails and 180 heads.
- You cannot see them.
- You are asked to put your hands under the blanket without seeing the coins (nor feeling them).
- You have to split the coins into two groups.
- The groups need not be equal in number but **each group must have the same number of tails**.

Solution: Flipping Coins under the Table Cover

- Separate the coins into two groups: one group contains 20 and the other contains 180 coins.
- The smaller group will have X tails and (20 – X) heads.
- The other group must have (20 – X) tails since we started with a total of 20 tails showing.
- Flip all the coins in the first group (which contained 20).
- It started with X tails so now it will have (20 – X) tails and X heads.
- Now each group will each have (20 – X) tails. (If by chance there are 20 tails in the smaller group, the solution will still work.
- After the manipulation above, there will be 0 tails in each group).

Cut a Cake into 8 Equal Pieces

- Cut the cake into 8 equal pieces using only **3 straight cuts**.

- There are 2 solutions to this puzzle.

Solution: Cut a Cake into 8 Equal Pieces

- **Solution 1:**
  - Cut the cake into 4 equal quarters
  - Cut it horizontal to get 8 equal quarters
- **Solution 2:**
  - Cut the cake into 4 equal quarters
  - Place them on top of one another (to make a tower of 4 quarters)
  - Cut the tower vertically to get 8 equal quarters

The Manhole Cover

Why is the cover of a manhole **Round** when its frame is a **Square**?

Solution: The Manhole Cover

- Very Elegant
- If the manhole covers is square, and someone knocks it, it might fall into the hole
- Why? Because the side of the square is shorter than the diagonal of the hole
- Making it round (with a small lip) will inhibit it from falling into the hole
- (You cannot force the cover of a NIDO can into the can)

- Many problems rely on patterns
- Focus on finding such patterns

9

Look for Crazy Patterns

Find the Missing Number

1	2	3	4
3	5	8	12
4	9	17	29
5	14	31	?

Solution: Find the Missing Number

- Except for the top row and left column, there is a pattern
- Each cell contains the sum of the cell above it and the cell to its left
- Example: 8 = 3 + 5
- And 17 = 8 + 9
- The missing number = 29+31=60

1	2	3	4
3	5	8	12
4	9	17	29
5	14	31	?

Magically Sequenced Cards

- We will conduct this in the presentation and leave it to you to find the pattern

1) Select 9 cards at random and place them face down in 3 piles of 3 each.
2) Select 1 pile and peek and remember the card at its bottom
3) Place that pile over the other two (so your card is now 3rd from the top
4) Continue with this exercise . . .

Magically Sequenced Cards (Continued)

1) Spell the name of your card, say SEVEN by dealing one card for each letter: down on the table and face down. The others come on top
2) Place the remainder on top of the cards on the table.
3) Spell the term “OF” by dealing down in the same way, two cards. Place the remainder on top of the two.
4) Spell the suit, say HEARTS by dealing one card for each letter: down on the table and face down. Place the remainder on top.

Magically Sequenced Cards (Continued)

- Now you have a pile in your hand.
- Deal 5 cards from the top. The card you memorized at the beginning will be the 5^{th} card . . . .

Solution: Magically Sequenced Cards

- Column 1 shows the deck after Victor has chosen the card. The selected card is C, now the 3rd from the top.
- Column 2 shows the deck after Victor dealt down as many cards as the value of the chosen card. Now the card is 3rd from bottom. Since no card value has less than 3 letters, the chosen card will always be the 3rd from bottom.

Col 1	Col 2	Col 3	Col 4
Starting Pile	After Dealing Value	After Dealing "OF"	After Dealing Suit Name
A	E	G	B
B	F	H	A
C	G	I	F
D	H	D	E
E	I	C	C
F	D	B	D
G	C	A	I
H	B	F	H
I	A	E	G

Solution: Magically Sequenced Cards (Continued)

- Column 3 shows the deck after Victor has dealt down 2 cards (for "OF"). Now the chosen card is the 5th from the bottom (and the top) or if you want, in the middle of the pile
- Column 4 shows the deck after Victor has dealt down as many cards as there are letters in the suit name.

Col 1	Col 2	Col 3	Col 4
Starting Pile	After Dealing Value	After Dealing "OF"	After Dealing Suit Name
A	E	G	B
B	F	H	A
C	G	I	F
D	H	D	E
E	I	C	C
F	D	B	D
G	C	A	I
H	B	F	H
I	A	E	G

Solution: Magically Sequenced Cards (Continued)

- Since no suit name has less than 5 letters, the card will always remain in the 5th position. This can work in any language as long as the number of letters in the numbers and in the name of the suits is 3 or more.
- (It does not work in French since an Ace in French is called “As” which will fail the logic above.)

Col 1	Col 2	Col 3	Col 4
Starting Pile	After Dealing Value	After Dealing "OF"	After Dealing Suit Name
A	E	G	B
B	F	H	A
C	G	I	F
D	H	D	E
E	I	C	C
F	D	B	D
G	C	A	I
H	B	F	H
I	A	E	G

Solution: Magically Sequenced Cards (Continued)

- Since no suit name has less than 5 letters, the card will always remain in the 5th position.
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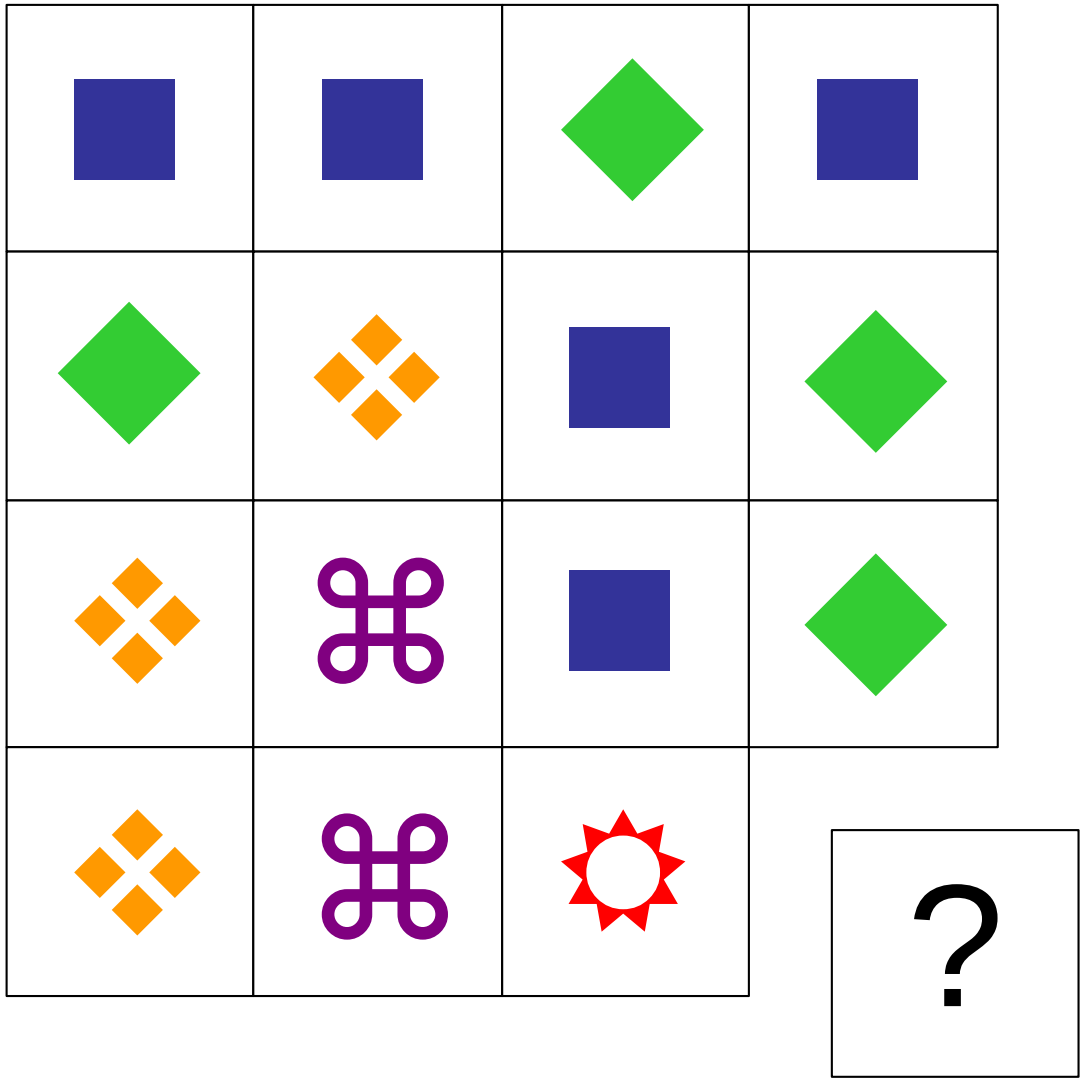
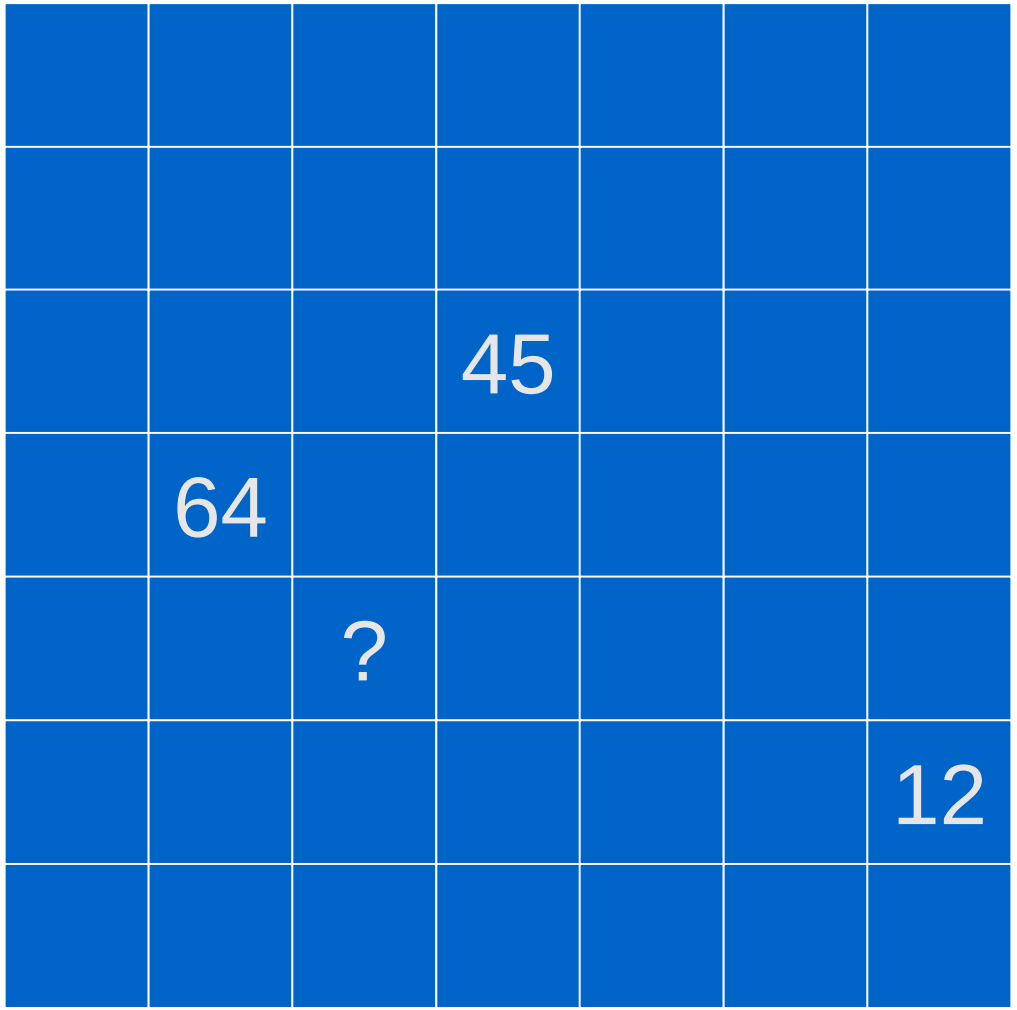
Find the Missing Symbol



Solution (Difficult): Find the Missing Symbol

- Horizontally, from left to right and downwards.
- Series 1 starts in cell 1 and contains a blue square.
- Series 2 starts in cell 2 with a blue square and adds a green diamond to it in cell 3.
- Series 3 starts with a blue square in cell 4, then a green diamond in cell 5 and adds the 4 orange diamonds in cell 6.
- And so on: Series 4 has 4 cells and series 5 has 5 cells.
- You will find Series 6 starts in the last square and must have a blue square.

Find the Missing Number



Solution: Find the Missing Number

- The crazy pattern is this . . .
- Each number is made up of 2 digits
- The left digit is the number of the column from the right
- The right digit is the number of the row from the bottom
- Therefore, the answer is 53
- The number is found in the 5^{th} col from the right and the 3^{rd} row from the bottom

Find the Next Number in this Series

1

11

21

1211

111221

?

Solution (Difficult): Find the Next Number

- Row 2 is 11: first digit (1) is the number of times the second digit (1) shows up in Row 1.
- Row 3 is 21: first digit (2) is the number of times the second digit (1) is shown in Row 2
- Row 4 is 1211: 1 is the number of 2's in Row 3 and 1 is the number of 1's in Row 3
- Row 5 follows the same logic
- Row 6 = 312211 (3 ones, 2 twos and 1 one)

1

11

21

1211

111221

?

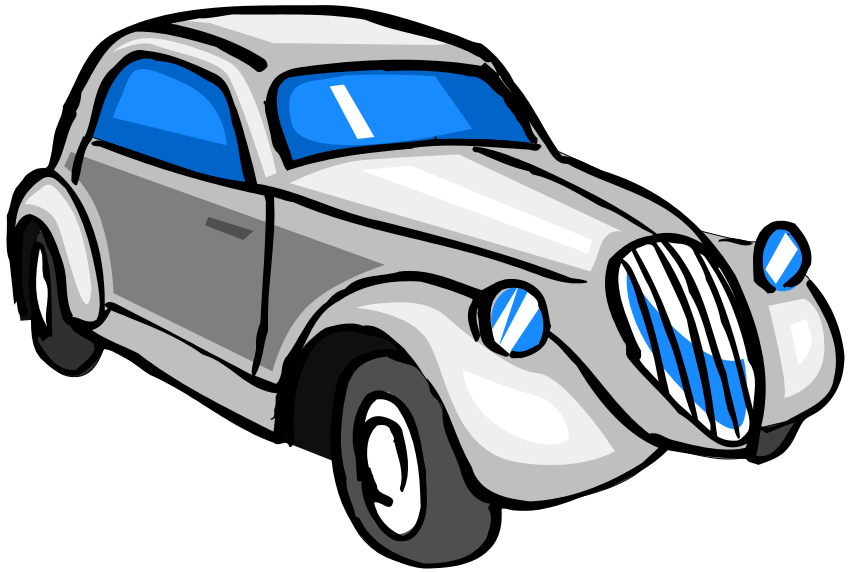
- Some problems do not have a solution
- Do not despair
- It is enough to prove that to yourself

10

Some Problems might have NO Solution

What is the Speed on the Return Trip?

- I drove my car from my hometown to my university town.
- My speed was 60 kilometers per hour.
- **At what speed do I need to drive on the way back so that my total trip average would be 120 kilometers per hour?**
-
- Don’t bother saying it is 180 kilometers per hour. (Avoid obvious solutions).



Solution:
What is the Speed on the Return Trip?

- Assume that the distance to my university is 60 kilometers.
- By driving at 60 mph, I can get there in one hour.
- To double my rate, I have to drive 120 km in 1 hour.
- But I would have already used up that hour going to the university!!!
- It would be impossible to drive the returning 60 kilometers in 0 time.

The Lawyer and his Student

- A lawyer liked one of his students.
- The student could not pay his teacher because he was poor.
- So, the lawyer made this agreement with him:

1) If you **win your first case**, whether you are suing or being sued, you would have made money, so you pay me.

2) If you **lose your first case**, then I am a bad teacher and you do not have to pay me at all.

- Many years passed and the student did not take on any case!!

(Continued)

Continued: The Lawyer and His Student

- The teacher became impatient waiting for his money and took his student to court.
- The student decided to defend himself: his first case

1) **If the student loses the case**, the court will force him to pay the teacher. Yet, the agreement was that if the student lost, he need not pay the teacher.
2) **If the student wins the case**, the court will not require him to pay his teacher. However, according to the old agreement, if the student wins, he has to pay.

How to resolve this situation?

Solution: The Lawyer and His Student

- There is no contradiction here.
- There is no solution!
- The judge dismissed the case for suing the student.
- The agreement stated that the student should either pay or be exempted forever **once he is part of a case**.
- Up until the teacher decided to take him to court, the student had not been part of any case, so the case was dismissed.

One more . . .

Non-Sensical Puzzles

What is the difference between a duck?

It has one leg both the same.

Thank you for your kind attention