

# How to Solve Puzzles

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What is  
the difference  
between a duck?

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It has one leg  
both the same

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The best way to solve puzzles is to find out what **type of a puzzle** you are facing.

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## Classification of Puzzles by Mode of Solution

- 1) Too much information
- 2) Contradictory information
- 3) I didn't know you could do that . . . .
- 4) Avoid the Obvious Solution
- 5) Don't Ignore Obvious Facts
- 6) Expressing the Question Differently
- 7) Look for the Twist
- 8) Look for Crazy Patterns
- 9) "What If" Puzzles
- 10) AHA and GOTCHA Puzzles

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## Type 1: Too Much Information



- A man wanted to buy sunglasses 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 shopkeeper gave the glasses to the customer
- He also gave him the change for \$100: or \$40
- Later, neighbor comes to say \$100 note was forged.
- The shopkeeper gave him a valid \$100
- **How much did the shopkeeper lose?**

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## Type 2: Contradictory information



Three friends went into a restaurant to have a meal. Each paid \$10 for his meal. 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. Thinking that it would be difficult to divide the \$5 into three equal parts, he gave each customer \$1. They asked him to thank the owner and left.

Since each had paid \$9, the total paid was \$27. The cashier stole \$2, bringing the total to \$29. **Where is the missing \$1?**

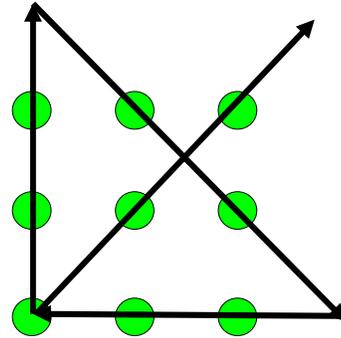
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## Type 3: I Didn't Know you Could Do That . . .

Connect the 9 dots with 4 straight lines.

Start on any dot, then proceed by drawing straight line segments through all the others. There are 3 conditions for this puzzle:

- 1) You must pass through all the dots
- 2) You are only allowed 4 straight line segments
- 3) You cannot lift the pen as you draw the 4 segments



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## Type 4: Avoid the Obvious Solution

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

2) How many cubic meters of soil does a hole have if it measures 2 x 3 x 4 meters?

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## Type 4: Avoid the Obvious Solution

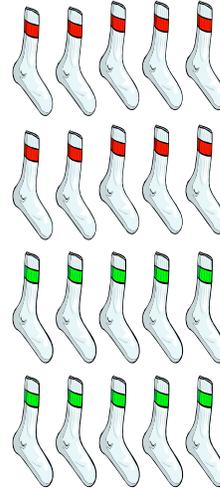
I jog early in the morning.

I have to get dressed in the dark so as not to wake my wife up.

I pick up my stuff from the jogging drawer then I get dressed in the bath room.

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?**



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## Type 5: Don't Ignore Obvious Facts

A poor beggar could not afford cigarettes.

He went around collecting already smoked cigarette stubs.

He would group 4 cigarette stubs to make one full cigarette and then smoke it.



One day, he collected 16 stubs

**How many cigarettes can he smoke?**

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## Type 6: Express the Question Differently

A man leaves his office everyday at the same time.

His wife drives from home to pick him up.

She has it timed so that she arrives at his office just as he is leaving it. They turn around and head home.

They get there at the same time every day.

One day, he finished work 1 hour earlier than usual. He decided to walk along the road his wife uses to reach him.

After a while, he saw her driving towards him. He flagged her down. They turned around and went back home.

This time, they got home 30 minutes earlier than usual.

**How many minutes did he walk before he met his wife?**

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## Type 6: Express the Question Differently

An egg seller told his wife: "I run out of eggs in the shop"

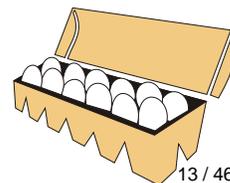
A buyer said : I want to buy  $\frac{1}{2}$  your eggs and  $\frac{1}{2}$  an egg. I sold him what he wanted.

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.

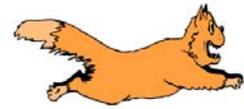
I then ran out of eggs.

How many eggs did the egg seller start with before the first buyer came?



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## Type 7: Look for the Twist



A cat and dog ran a race. The cat and the dog had to run 100 feet, reach the end, turn around and go back to the starting point.

The strange thing about this race is that the cat and the dog had **to hop and not run**. The dog ran in leaps of 3 feet each while the cat ran in leaps of 2 feet. Their speeds? For each 3 leaps of the cat, the dog leapt 2 at the same time.

**Did he or she win?**

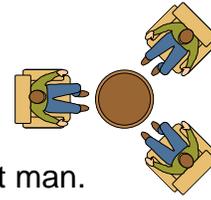
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## Type 8: Crazy Patterns

1	2	3	5
3	5	8	11
4	9	17	26
5	14	31	?

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## Type 9: What IF Solutions



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.

**Moments, one man said, “My hat is red”.  
How did he find out?**

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## Type 10: AHA and GOTCHA Puzzles

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

There are 2 solutions to this puzzle.



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## Type 10: AHA and GOTCHA Puzzles after which you will slap your forehead

I have a friend who can tell the score of every football match before it starts. He is always right.

**How can that be?**

What was the name of the Secretary General of the United Nations, in 1945.

**There is a solution!**

Mr. and Mrs. Nammour have a strange family. They have 5 children. Half of them are girls.

**How can that be?**

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## Type 10: AHA and GOTCHA Puzzles

Why is the cover  
of a manhole  
(plaque de regard)  
**Round**  
when its frame is a  
**Square?**

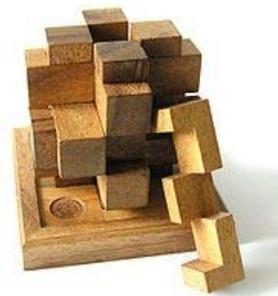


The following types can only be solved by Brute Force, Persistence and Elaboration.

Except for the mechanical puzzles, all of them can be solved by computer programs

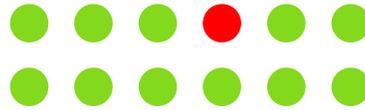
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## Mechanical Puzzles



## Decision Tree Puzzles

You have 12 marbles  
One of them is either heavier  
or lighter than the rest.  
In three weighs on a balance  
scale, you must determine  
which is the odd marble.  
How do you do this?



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## Decision Trees: Einstein's Puzzle

In a street there are five houses, painted in 5 different colors.  
In each house lives a person of different nationality  
These 5 homeowners each drink a different kind of beverage,  
smoke different brand of cigar and keep a different pet.

Use the clues on the next slide to find out  
**who owns the fish!**

It is not certain that Einstein created this puzzle

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# Einstein's Puzzle (Doubtful it was him!)

1. The British man lives in a red house.
2. The Swede keeps dogs as pets.
3. The Danish man drinks tea.
4. The Green house is next to, and on the left of the White house.
5. The owner of the Green house drinks coffee.
6. The person who smokes Marlboro rears birds.
7. The owner of the Yellow house smokes Dunhill.
8. The man living in the center house drinks milk.
9. The Norwegian lives in the first house.
10. The man who smokes Winston lives next to he who keeps cats.
11. The man who keeps horses lives next to he who smokes Dunhill.
12. The man who smokes Kent drinks beer.
13. The German smokes Lucky Strike.
14. The Norwegian lives next to the blue house.
15. The man who smokes Winston has a neighbor who drinks water.

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House	Color	Nationality	Beverage	Cigarettes	Pet
1	Yellow	Norwegian	Water	Dunhill	Cat
2	Blue	Danish	Tea	Winston	Horses
3	Red	British	Milk	Marlboro	Birds
4	Green	German	Coffee	Lucky Strike	Fish
5	White	Swedish	Beer	Kent	Dogs

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## Deductive Reasoning Solutions



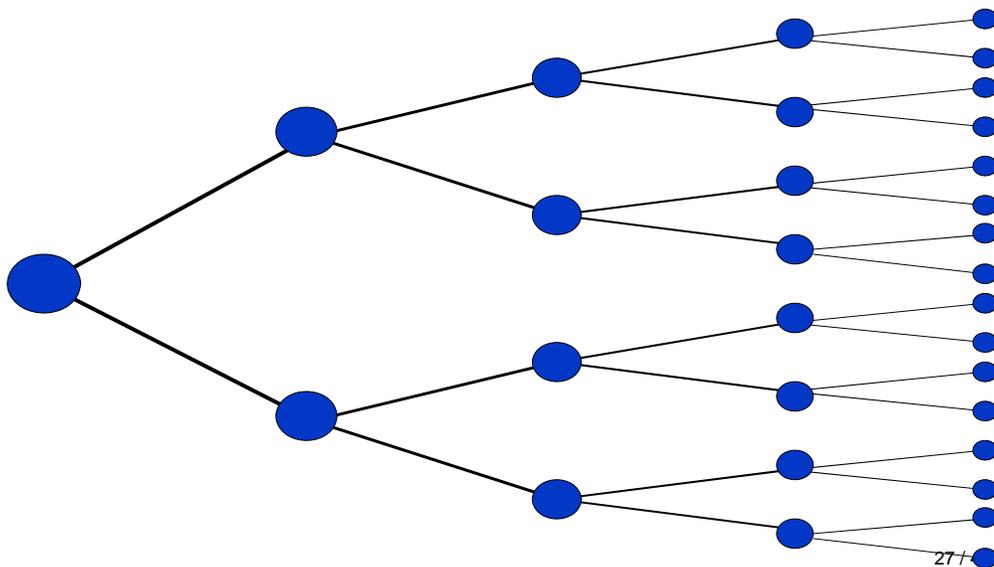
It happened one day that Miss Pink, Miss Green and Miss Violet met for lunch. It so happened that they were wearing jackets of three different colors: pink, green and violet.

The lady wearing the violet jacket said: "Isn't it strange that none of us is wearing the color that matches her name?". Miss Green replied: "Yes, that is true".

What was the color each lady was wearing?

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## The Use of Decision Trees



## Another Deductive Reasoning Puzzle

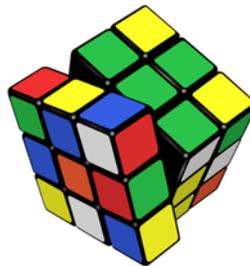
The table shows the results of a particular tournament between three teams: A, B and C. Each team played a single match against the other two, so we had 3 matches.

Find the score of every one of the 3 matches knowing that some results are missing from the table.

Team	Played	Won	Lost	Drawn	Goals For	Goals Against
A	2		2		2	
B	2				3	
C	2			1	2	0

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## Brute Force Puzzles



7	8	5	2	6	4	3	9	1
6	4	3	8	9	1	7	2	5
1	2	9	3	7	5	6	8	4
2	3	1	9	5	8	4	7	6
5	6	8	7	4	2	1	3	9
4	9	7	6	1	3	2	5	8
3	7	6	4	8	9	5	1	2
8	1	4	5	2	7	9	6	3
9	5	2	1	3	6	8	4	7

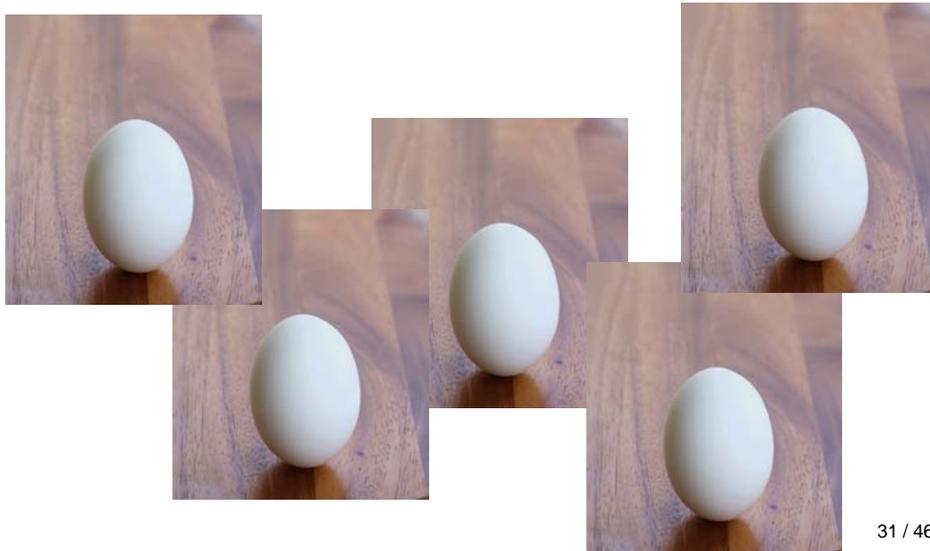
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# Now for an Assortment of Puzzles without Classification

We will try to identify each  
Type before Solving the  
Puzzle

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Columbus's Problem:  
Stand an Egg on its Edge



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## Flipping the Coins Upside Down

You have 200 coins laid up on a table  
There are **20 Tails** and **180 Heads**.

You cover the table with a blanket

Now put your hands under the blanket  
without seeing the coins.

**Task:** split the coins into 2 groups that  
have the same number of **Tails**.

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## The Disconnected Light Bulb



I have 3 switches next to a door  
One for the entry, one for the corridor  
and one for the table lamp in my  
office

Each lamp is connected to a cable  
coming to the switch box

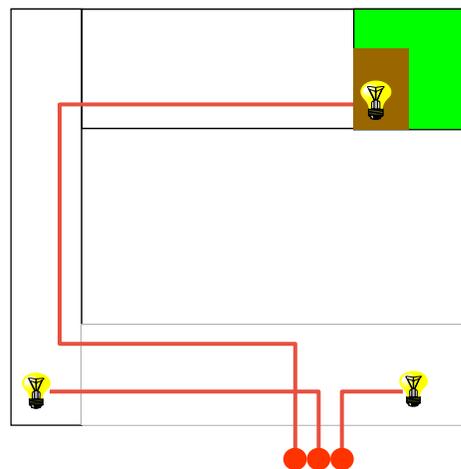
Only the cable of the Desk Lamp in  
the office is connected to its switch

We do not know which switch it is  
connected to

You can manipulate the switches the  
way you want : ONCE

Then you can visit the office : ONCE

Find a way to determine which  
switch turns it on/off.



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## My Sister's Age

My sister is a very elusive person  
(Especially about her age).

Her doctor asked her how old she  
was. She said:

“In two years time, I will be twice as  
old as I was five years ago”.

How old was she when she  
said that?



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The diagram  
shows you the  
column and  
row totals.

				110
				110
				110
				110
90	105	125	?	

Find the  
missing total

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## The Expanding Water Lilly

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?

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## Two Fathers and Two Sons

Two Fathers and Two Sons were walking on a country road

They found 3 coins of \$1 each

They distributed the coins equally without anyone getting a lower share

**How could they do that?**

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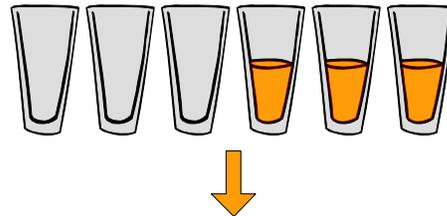
## Find the Next Number in this Series

1  
11  
21  
1211  
111221  
?

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## Move One Glass Only . . . .

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?



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## The Population Control Problem



A government was worried about the high rate of population growth in its country. It issued this decree to help control overpopulation.

Ignore what children a family already had. Use these rules:

- 1) Families can go on having children until they get a son. They must then stop having any children.
- 2) They cannot have more than 3 girls. They must also stop.
- 3) Families can stop any time after 1 child or 2 children

What happens to the population balance after many years?

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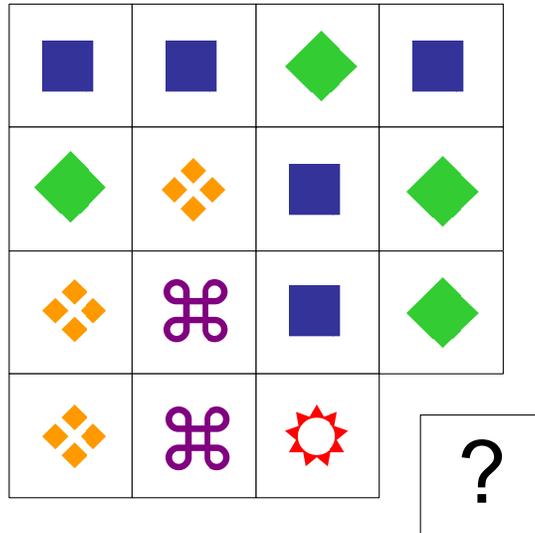
## The Fatal Dream in the Cinema

A man and his wife went to the cinema. They were watching a boring film, so he slept in his seat. He dreamt about the film and saw himself being executed instead of the criminals in the story. His wife noticed that he was sleeping, so to wake him up, she jokingly tapped the back of his neck with a chocolate bar. In his dream, he saw the executioner's sword fall right on his neck. The shock gave him a heart attack and he died without uttering a sound.

Is there anything wrong with this story?

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What is the Missing Symbol?



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## The Hungry Hunter

A hunter became hungry and had no food.

Soon, he met two 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?**

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## Solution: The Hungry Hunter

**Avoid the obvious:** \$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  $\frac{1}{3}$  of the 8 loaves or  $\frac{8}{3}$ .

This is equal to 2 loaves +  $\frac{2}{3}$  of a loaf.

The hunter's share was  $\frac{8}{3}$  and he paid \$8 so he paid \$1 for each  $\frac{1}{3}$  of a loaf

The first hunter had  $\frac{9}{3}$  loaves but only ate  $\frac{8}{3}$  so shared  $\frac{1}{3}$  with our hunter who gave him \$1

The second hunter had  $\frac{15}{3}$  loaves but only ate  $\frac{8}{3}$  so shared  $\frac{7}{3}$  with our hunter who gave him \$7.

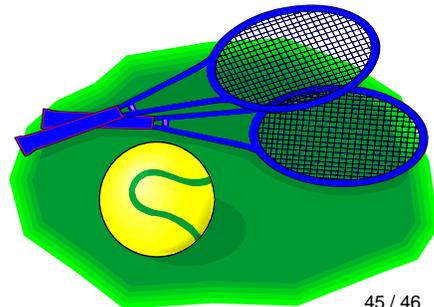
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## How Many Tournaments?

If 36 players are to play in a tennis tournament, you can easily find out how many matches are required by drawing the tournament tree and counting the matches.

But there is a simpler and more elegant way of find the answer, AND without pencil and paper.

**How can you do it?  
And for any number  
of players too?**



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Thank you  
for your  
kind attention