How to Solve It?

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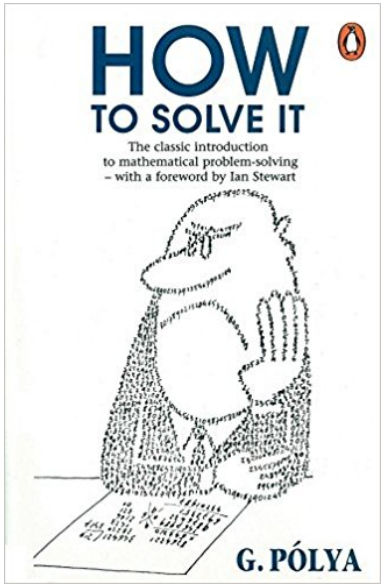
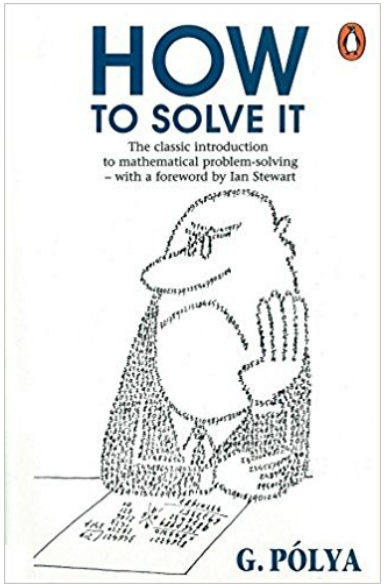
The list



1. Understanding the problem
2. Devising a plan
3. Carrying out the plan
4. Looking back

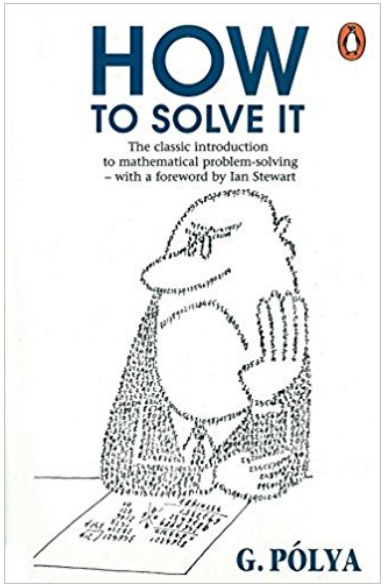
The list



Don't Fear!

1. Understanding the problem
2. Devising a plan
3. Carrying out the plan
4. Looking back

The list



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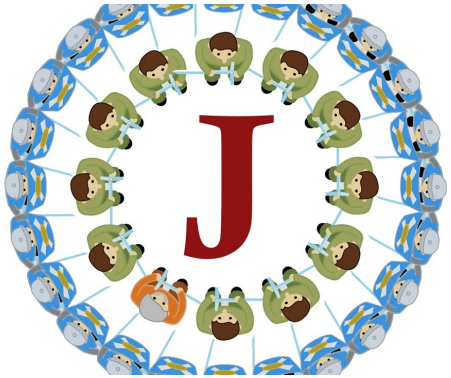
Keep Asking Yourself Questions!

How to Solve It?

The Josephus Problem



$$J(n) = ?$$

$$J(2n) = 2J(n) - 1, \quad n \geq 1$$

$$J(2n+1) = 2J(n) + 1, \quad n \geq 1$$

Small cases

Making a guess

$$J(2^m + l) = 2l + 1, \quad m \geq 0, 0 \leq l < 2^m$$

How to prove it?

Looking back

Can you check the result?

– G. Póya

$$J(2^m) = 1$$

Looking back

Can you see it at a glance?
– G. Póya

$$J(2^m + l) = 2l + 1$$

Looking back

Can you derive the result differently?

– G. Póya

Looking back

generalize???

– G. Póya

How to Solve It?

CSC

Angle trisection

To prove that "angle trisection" is impossible!

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- Given an arbitrary angle α.
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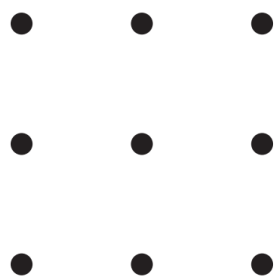
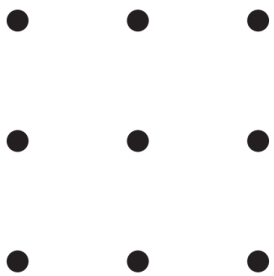
Do you really understand the problem?

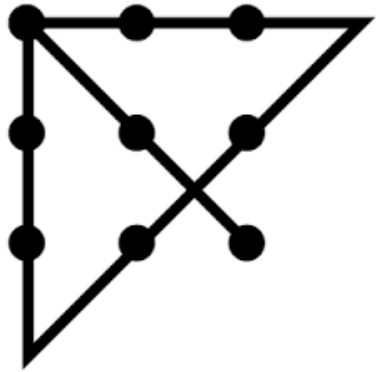
How to Solve It?

Straightlines



Straightlines





24 Game

$$5 \quad 5 \quad 5 \quad 1$$

24 Game

$$5 \quad 5 \quad 5 \quad 1$$

$$3 \quad 3 \quad 8 \quad 8$$