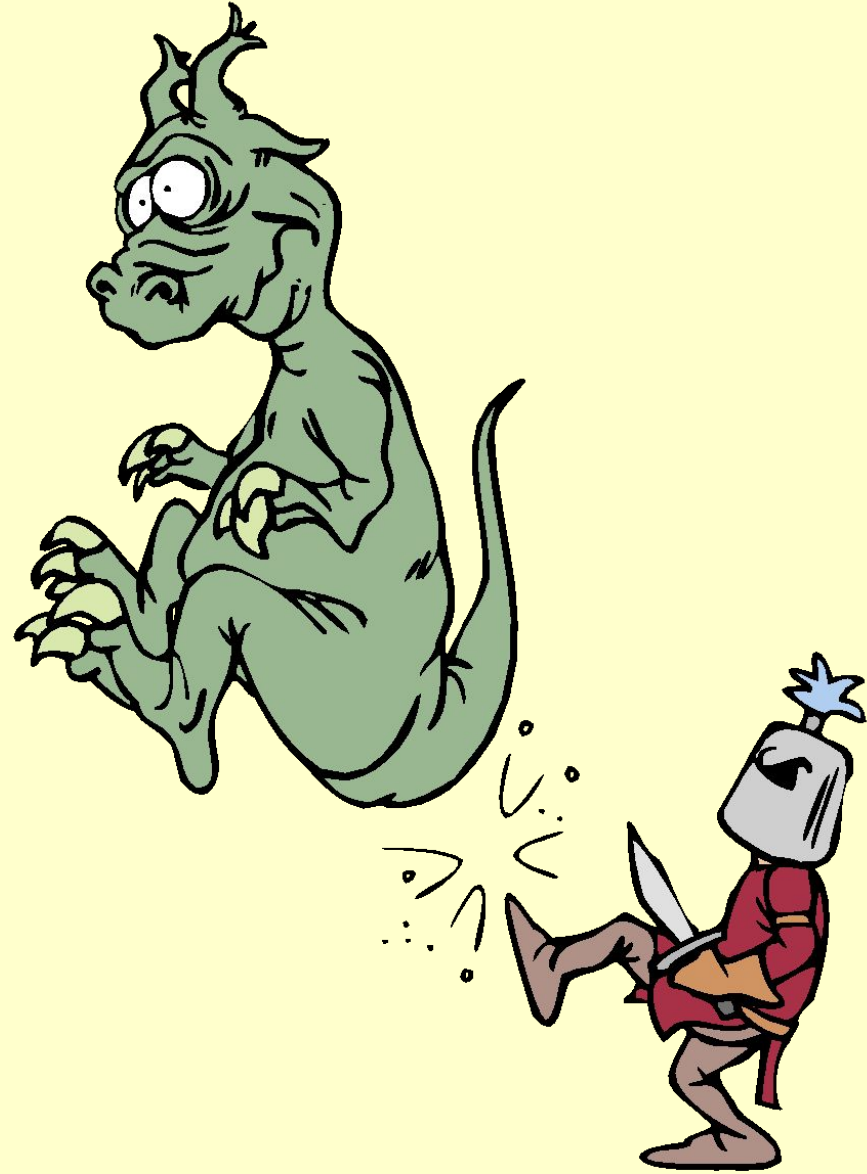


King Arthur's Problem



King Arthur had a problem. It was time for his daughter Glissandra to marry and he had to find a suitable husband for her. Now Glissandra loved mathematics so much that she spent much of her time solving and making up mathematical problems. She had just one requirement for her husband to be. That he must love maths as much (if not more) than she does!

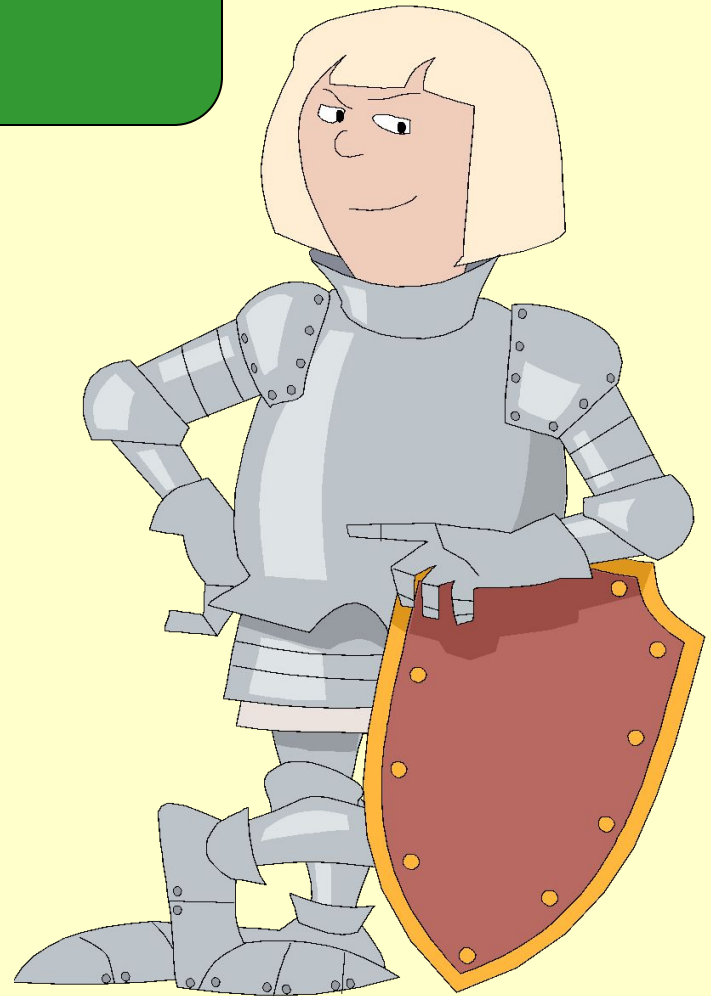
Now King Arthur loved his daughter dearly and would do anything for her but he couldn't think how to find a suitable husband for her. All the Knights of the Round Table were outdoor, macho types who spent their days jousting and slaying dragons not doing sums! So the king sought Glissandra's help. "How shall I find you a husband who loves maths as much as you?" He asked. "Can I just ask them?"



I just lurrve quadratic
equations!

“Oh no” said Glissandra
“That wouldn’t be a good
way. Some would answer
yes just to marry me.”

She thought for a moment. “I
have it” she cried “we must
devise a mathematical test!”



The next day at breakfast
Glissandra had an idea.

“Daddy, how many knights sit at
your round table ?” she asked.

“It varies” the King replied
“Sometimes there’s as many as
fifty, other times there’s just a
few” He paused “Why ?”

“I have a test” she answered
“You can give it at your meeting
tomorrow to the Knights of the
Round Table”



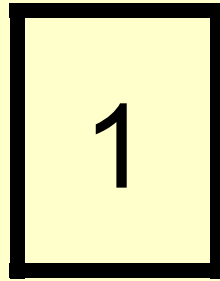
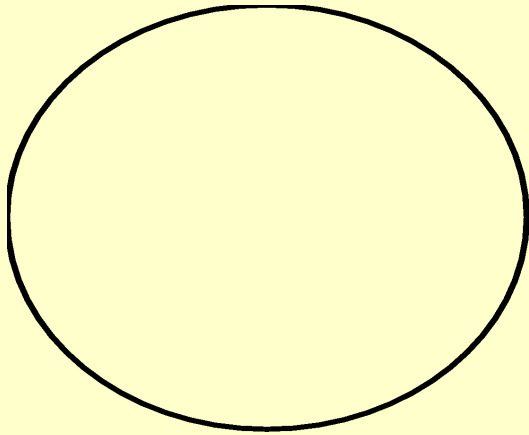
Here is the problem....

We will number each of the chairs around your round table. Every person will know what numbers are on the chairs and in which direction the numbers go. In order to choose my husband you draw your sword and point to the knight in the first chair saying “you live”. Then point to the knight in chair number 2 and say “you die” and chop off his head. To the third knight say you live, to the fourth knight “you die” and so on until there is only one knight left. “That’s the one I’ll marry” King Arthur was worried, he loved his daughter but didn’t want to go around killing his knights.

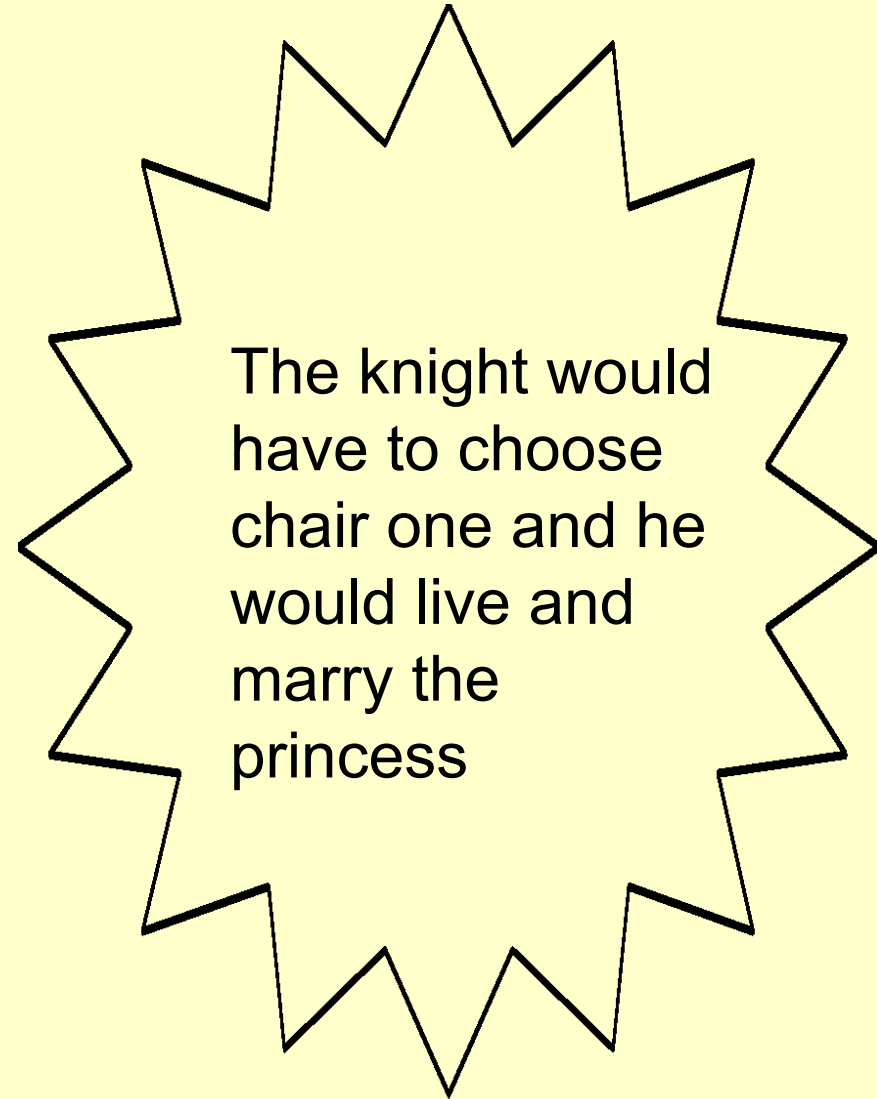
“Oh Daddy” Glissandra reassured him “I don’t really want you to kill anyone - its a maths problem. You just need to set the knights the problem. To find the man of my dreams I want the man when given the number of chairs round the table will know where to sit to survive and so win my hand in marriage!”

Can you help solve the
Problem?

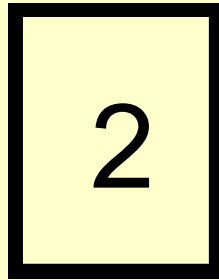
Suppose there were just one
chair....



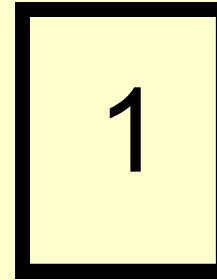
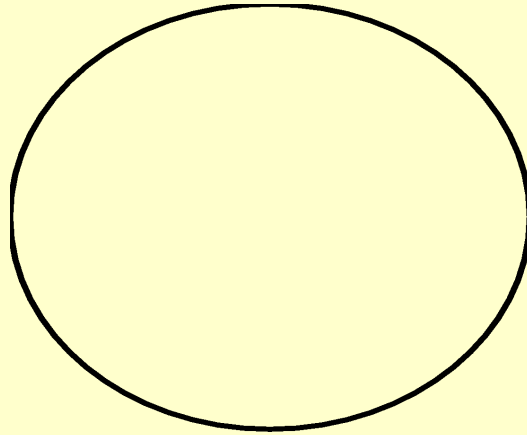
Live



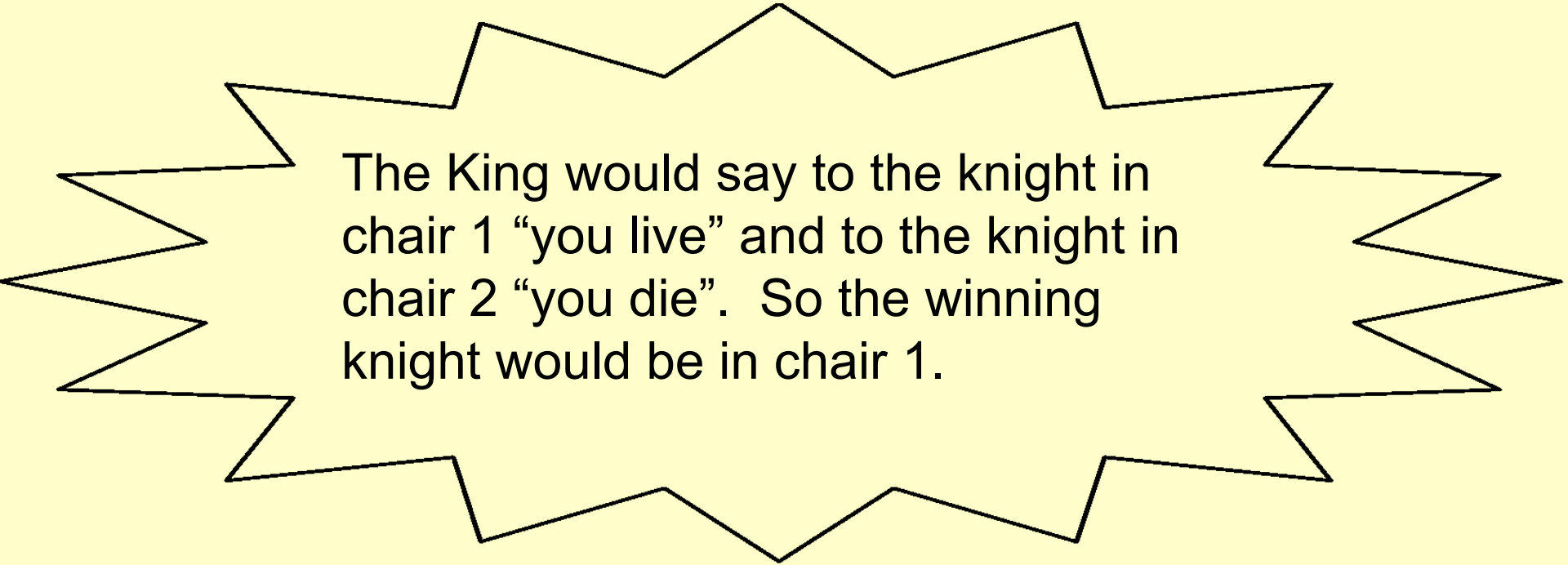
Suppose there were two chairs....



Die

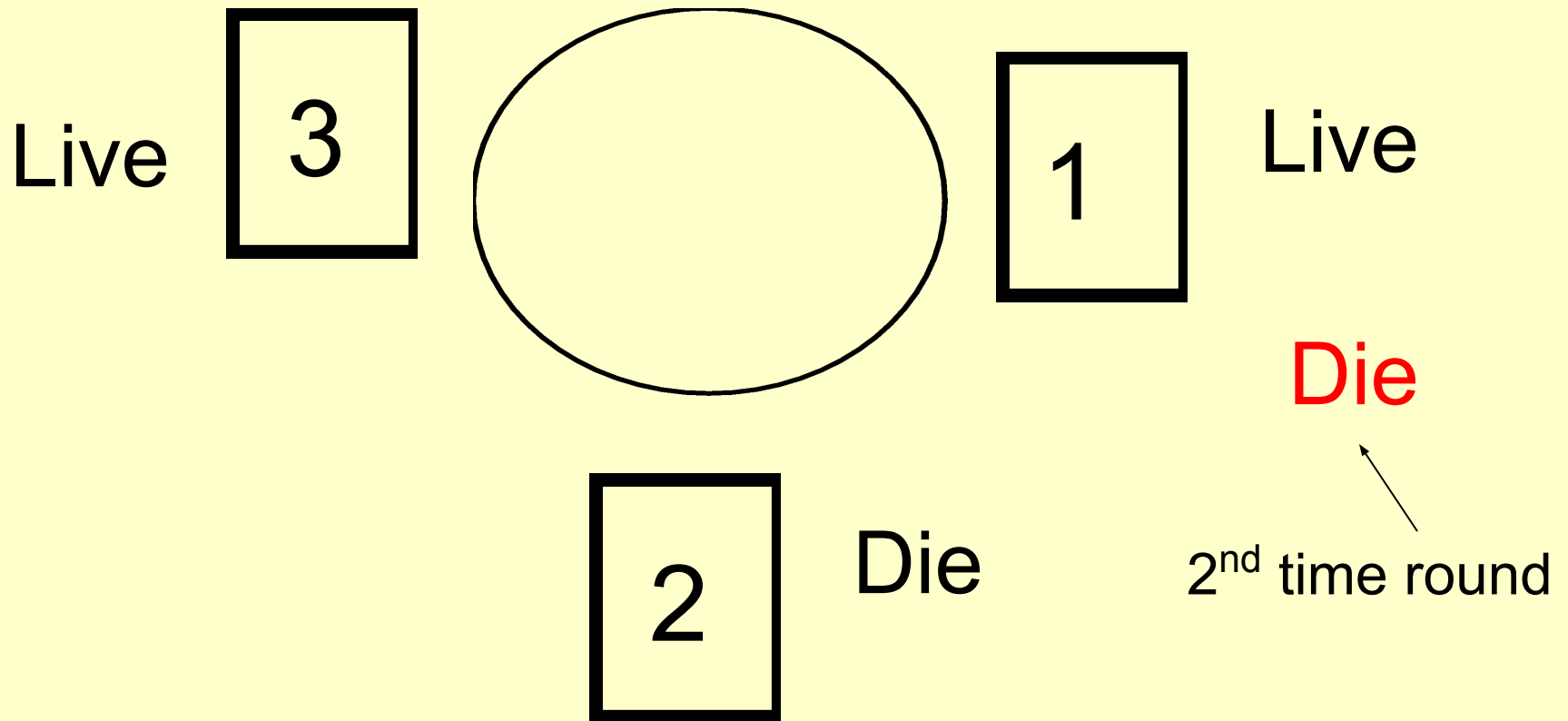


Live

A large, jagged starburst shape with a black outline, containing text.

The King would say to the knight in chair 1 “you live” and to the knight in chair 2 “you die”. So the winning knight would be in chair 1.

Suppose there were now three
chairs....



The King would say to the knight in chair 1 “you live” and to the knight in chair 2 “you die. The king would say to the knight in chair 3 “you live”. There would still be 2 knights left alive. So the King would carry on and say to the knight in chair one “you die”. So the winning knight this time would be in chair three.

So for 1 chair you'd need to sit in chair 1, for 2 chairs you'd need to sit in chair 1 but for 3 chairs you'd need to sit in chair 3! What do you think will happen for 4, 5, 6 chairs and so on ?

If you were a knight
could you choose the
right chair ?

Given any number of
chairs – could you
immediately ask to sit in
the winning chair ? It
could be a matter of life
or death

Have a go at finding the
winning chair for 4, 5, 6
chairs and so on.



Recording results in a table will help you to spot any patterns so record all your results in the table provided.



Can you use
the what you
have found in
your table to
predict some
results ?

