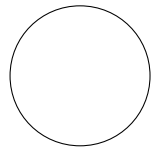
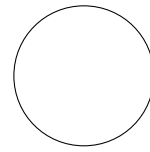


Word Dozen contest

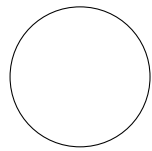
Placing a poker chip of your color, selects a word. The first player whose words have (at least) 3 copies of *some* letter, *wins*.



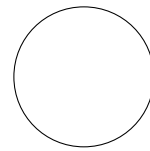
BIT



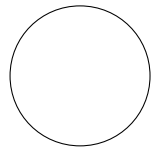
GOLF



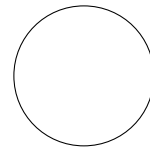
BRAT



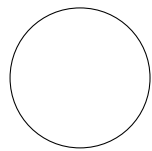
KNOW



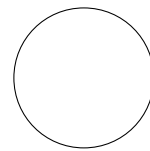
DRY



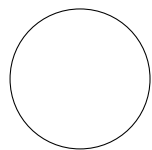
NAPE



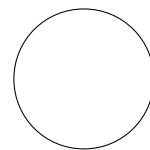
DUCK



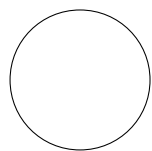
PIG



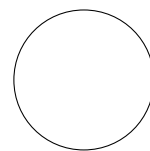
FUEL



SIN



GAS



STOP

Have You played this game before ?

Shhh!

Word Dozen *is, secretly, Tic Tac Toe!*

When your opponent chooses a word, you secretly mark it, either × or ○, on this board:

NAPE	KNOW	SIN
BRAT	STOP	BIT
GAS	GOLF	PIG

Removing letter -foliage. . .

BIT	GOLF
BRAT	KNOW
DRY	NAPE
DUCK	PIG
FUEL	SIN
GAS	STOP

*Some letters are **rare**; they occur only twice, or only once:*

*Letter **B** occurs only in **BIT** and **BRAT**,*

***R** only in **BRAT** and **DRY**,*

***L** in **FUEL** and **GOLF**,*

***F** only in ???,*

***K** only in ???,*

***W** only in ???, and*

***E** only in ???.*

Can you put your finger on other rare letters?

*The other rare letters: D,Y,U and C.
Deleting word-foliage. . .*

BIT	GOLF
BRAT	KNOW
DRY	NAPE
DUCK	PIG
FUEL	SIN
GAS	STOP

So, **secretly**, our word list reduces to:

IT	GO
AT	NO
	NAP
	PIG
	SIN
GAS	STOP

We have:

1 **four**-letter word,
4 **three**-letter words, and
4 **two**-letter words.

What game has this

1, 4; 4, 3; 4, 2
structure?

Tic Tac Toe!

NAP	NO	SIN
AT	STOP	IT
GAS	GO	PIG

The number of letters in a word, is how many TTTs it lies in.

Vertical-TTTs are vowels,

Horizontal-TTTs are consonants;

diagonals are **P** and **S**.

Inserting the original words into the TTT-board

NAPE	KNOW	SIN
BRAT	STOP	BIT
GAS	GOLF	PIG

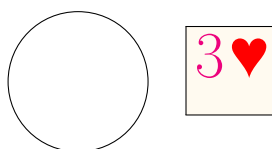
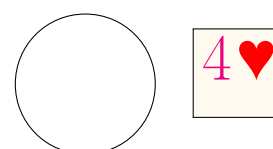
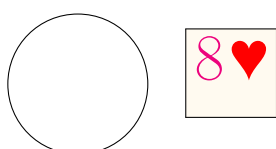
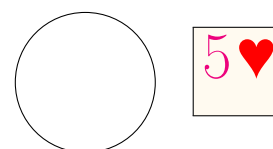
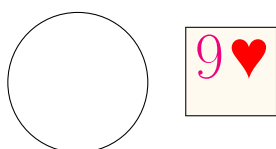
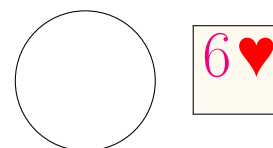
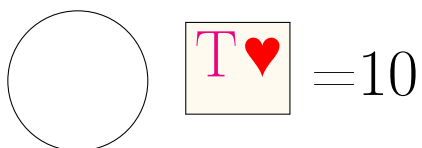
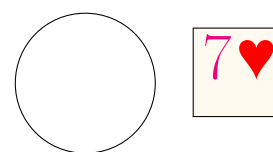
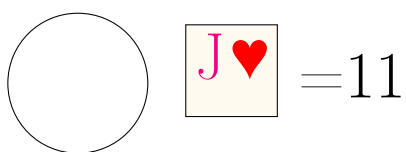
gives an isomorphism from TTT to the original game.*

iso morph ism
 same form

Simplified Blackjack

Blackjack(=21) is the goal.

Placing a poker chip of your color, selects a card. The first player with 3 numbers that add to (exactly) 21, *wins*.



Have You played this game before ?

Shhh!

Simplified Blackjack is, *secretly*, *Tic Tac Toe!*

When your opponent chooses a word, you secretly mark it, either × or ○, on this board:

4♥	J♥	6♥
9♥	7♥	5♥
8♥	3♥	T♥

Suppose we subtract 1 from each card-value. We're now playing with this deck:



Since we need 3 cards to win, our new target is $21 - 3$, i.e. 18. This gives us a game which is isomorphic to BLACKJACK.

What happens if we continue this line of thought to its logical conclusion ?

Logical Conclusion. ... we iterate the idea.

Since $\frac{21}{3} = 7$, subtracting 7 from each card gives symmetry

+4♥	+3♥	+2♥	+1♥	0♥	-1♥	-2♥	-3♥	-4♥
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with 0, now, as the target sum.

The symmetry of the new list suggests a *Magic Square!*

-3♥	+4♥	-1♥
+2♥	0♥	-2♥
+1♥	-4♥	+3♥

Simplified Blackjack is, *secretly*, *Tic Tac Toe!*

Using the original card-list...

4♥	J♥	6♥
9♥	7♥	5♥
8♥	3♥	T♥

... gives an *isomorphism* of BLACKJACK. to TTT.

iso morphism
 same form