M
S C R A B B L E
T
H

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A game of *Scrabble* was played by two mathematics students and peculiarly enough every word was a math word (or almost!).

The game was played on a regulation *Scrabble* board using the standard rules for *Scrabble*. The following abbreviations are used on the board: TWS = Triple Word Score; DWS = Double Word Score; TLS = Triple Letter Score; and DLS = Double Letter Score. The chart below gives the frequency and the value of the Letter tiles:

Tile	Frequency	Value		Tile	Frequency	Value
A	9	1		N	6	1
B	2	3		O	8	1
C	2	3		P	2	3
D	4	2		Q	1	10
E	12	1		R	6	1
F	2	4		S	4	1
G	3	2		T	6	1
H	2	4		U	4	1
I	9	1		V	2	4
J	1	8		W	2	4
K	1	5		X	1	8
L	4	1		Y	2	4
M	2	3		Z	1	10
				Blank	2	0

Play alternated between the two math students until all but three tiles were played (V, F, and U). You must determine each word played, correct placement on the board, and the score at the end of the game. You are given a clue for each word played. The correct placement of the first letter of the first word has been given to you. Remember that no more than SEVEN additional letters may be placed at one time. In this game, blanks were played only after all tiles of a particular letter were played (the two blanks were played in move #13 and move #17).

Score		Clues
Player 1	Player 2	
_____	X	1. The name of the point whose coordinates are (0,0). Word begins at (6,8).
X	_____	2. One of the three undefined terms of geometry (a "dot" with zero dimensions). Word begins at (11,11).
_____	X	3. The name for the y-coordinate. Word begins at (6,8).
X	_____	4. The equation y = 3x - 1 is called a _____ equation. Word begins at (5,5).
_____	X	5. The line, all of whose y-coordinates equal zero, is called the x-_____. Word begins at (6,3).
X	_____	6. An angle divides the plane into three sets of points: the angle, the exterior, and the _____. Word begins at (8,8).
_____	X	7. The formula $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ is called the _____ formula. Word begins at (11,14).
X	_____	8. The mathematical theory, founded by John von Neuman, of optimal behavior in situations involving conflicts is called _____ theory. Word begins at (9,14).
_____	X	9. One of the four sections into which the two coordinate axes separate the plane. Word begins at (8,12).
X	_____	10. The first number of an ordered pair is called the x-_____ . Word begins at (6,10).
_____	X	11. $\frac{y_2-y_1}{x_2-x_1}$ is the formula for the _____ . Word begins at (9,10).
X	_____	12. Plural of locus. Word begins at (4, 10).
_____	X	13. The identity element for addition. Word begins at (5,13).
X	_____	14. Plane geometry is _____ - dimensional. Word begins at (11,7).

Score		Clues
Player 1	Player 2	
_____	X	15. A statement that is proven to be true. Word begins at (4,1).
X	_____	16. $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ is known as the _____ formula. Word begins at (15,15).
_____	X	17. An arc of more than 180 degrees is called a _____ arc. Word begins at (2,7).
X	_____	18. An angle whose measure lies between 90 and 180 degrees is called _____ . Word begins at (13,7).
_____	X	19. The integer that follows four. Word begins at (2,12).
X	_____	20. The segment opposite the vertex angle of an isosceles triangle. Word begins at (11,3).
_____	X	21. In BASIC computer language, this statement assigns a value to a variable. Word begins at (4,3).
X	_____	22. A type of function. Word begins at (3,14).
_____	X	23. In ballistics, the angle between the direction of the axis of a shell and the direction of its velocity vector is the _____ angle. Word begins at (3,8).
X	_____	24. Owed or owing as a debt. Word begins at (2,2).
_____	X	25. One of the most important items in life insurance is the person's _____. Word begins at (13,12).
X	_____	26. "Every positive integer greater than 1 is prime or can be expressed as a product of prime numbers" is called _____ Fundamental Theorem of Arithmetic. Word begins at (13,5).
_____	X	27. These two students always _____ about math. Word begins at (1,14).
X	_____	28. Player 2 was left with the letter tiles F, U, and V, which she could not use.
_____	_____	TOTAL SCORE

The Initial Playing Board

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15	TWS			DLS				TWS				DLS			TWS
14		DWS				TLS				TLS				DWS	
13			DWS				DLS		DLS				DWS		
12	DLS			DWS				DLS				DWS			DLS
11					DWS						DWS				
10		TLS				TLS				TLS				TLS	
9			DLS				DLS		DLS				DLS		
8	TWS			DLS				DWS				DLS			TWS
7			DLS				DLS		DLS				DLS		
6		TLS				TLS				TLS				TLS	
5					DWS						DWS				
4	DLS			DWS				DLS				DWS			DLS
3			DWS				DLS		DLS				DWS		
2		DWS				TLS				TLS				DWS	
1	TWS			DLS				TWS				DLS			TWS

ANSWER KEY

Player #1			Player #2	
Points	Word	Move	Points	Word
14	origin	1		
		2	14	point
15	ordinate	3		
		4	12	linear
20	axis	5		
		6	27	interior
13	midpoint	7		
		8	9	game
58	quadrant	9		
		10	19	coordinate
9	slope	11		
		12	6	loci
24	zero	13		
		14	7	two
13	theorem	15		
		16	99	distance **
12	major	17		
		18	16	obtuse
20	five	19		
		20	6	base
3	let	21		
		22	14	kei
9	yaw	23		
		24	8	due
4	age	25		
		26	6	the

Player #1				Player #2	
Points	Word	Move	Points	Word	
20	yak	27			
		28	-9	-----	
234		TOTAL	234		

** The word DISTANCE occupies two triple word scores.
The rules state that the value for the word is tripled and then tripled again.

The Solution

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15															D
14	Y	A	K						G	A	M	E			I
13			E		Z						I				S
12		F	I	V	E			Q	U	A	D	R	A	N	T
11					r						P		G		A
10				L	O	C	I		S	L	O	P	E		N
9						O					I				C
8			Y			O	R	I	G	I	N				E
7		m	A	J	O	R		N			T	W	O		
6			W			D		T					B		
5					L	I	N	E	A	R			T	H	E
4						N		R					U		
3				L		A	X	I	S		B	A	S	E	
2		D	U	E		T		O					E		
1				T	H	E	O	R	E	M					

Lower case letters indicate blanks.