The following tables might be useful during the event.

	Α	В	С	D	E	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	s	Т	U	V	W	Х	Y	Z
Α	А	В	С	D	Ε	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Z
В	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Ζ	А
С	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Z	А	В
D	D	Ε	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Z	А	В	С
E	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Ζ	А	В	С	D
F	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Ζ	А	В	С	D	Ε
G	G	Н	I	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Ζ	Α	В	С	D	Ε	F
H	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Z	Α	В	С	D	Ε	F	G
I	I	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Z	А	В	С	D	Ε	F	G	Н
J	J	K	L	М	Ν	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	I
K	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	Ι	J
L	L	М	N	0	Р	Q	R	S	Τ	U	V	W	Χ	Y	Z	А	В	С	D	Ε	F	G	Н	Ι	J	K
M	М	N	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Z	А	В	С	D	Ε	F	G	Н	Ι	J	K	L
N	N	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Z	А	В	С	D	Ε	F	G	Н	Ι	J	K	L	М
0	0	Р	Q	R	S	Т	U	V	M	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	I	J	K	L	М	N
P	Р	Q	R	S	Т	U	V	M	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	Ν	0
Q	Q	R	S	Т	U	V	W	Χ	Y	Ζ	Α	В	С	D	Ε	F	G	Н	I	J	K	L	М	N	0	Р
R	R	S	Т	U	V	W	Χ	Y	Z	Α	В	\Box	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q
S	S	Т	U	V	M	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R
T	Т	U	V	W	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	S
U	U	V	W	Χ	Y	Z	Α	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т
V	V	M	Χ	Y	Ζ	Α	В	С	D	Ε	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	S	Т	U
W	M	Χ	Y	Ζ	А	В	С	D	Ε	F	G	Н	I	J	K	L	М	N	0	Р	Q	R	S	Т	U	V
X	Х	Y	Ζ	Α	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W
Y	Y	Z	А	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	M	Χ
Z	Z	А	В	С	D	Ε	F	G	Н	Ι	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	M	Х	Y
A	В	C	D	E	F	G	H	I	J	K		_	_		0	P	Q	R	S	T	U	V	W	X		
0	1	2	3	4	5	6	7	8	9	10) 1	1 1	2 1	.3 1	_4	15	16	17	18	19	20	21	22	2 23	3 2	4 25

AAAAA	Α
AAAAB	В
AAABA	C
AAABB	D
AABAA	Ε
AABAB	F
AABBA	G
AABBB	Н
ABAAA	I/J
ABAAB	K
ABABA	L
ABABB	M

ABBAA	N
ABBAB	О
ABBBA	P
ABBBB	Q
BAAAA	R
BAAAB	S
BAABA	T
BAABB	U/V
BABAA	W
BABAB	X
BABBA	Y
BABBB	Z

Frequency Table of English letters:

E	12.51%	S	6.54%	С	3.06%	G	1.96%	K	0.67%
Т	9.25%	R	6.12%	U	2.71%	M	1.92%	X	0.19%
Α	8.04%	Н	5.49%	M	2.53%	Y	1.73%	J	0.16%
0	7.60%	L	4.14%	F	2.30%	В	1.54%	Q	0.11%
I	7.26%	D	3.99%	P	2.00%	V	0.99%	Z	0.09%
N	7.09%								

Frequency Table of Spanish letters:

	-		_						
E	14.08%	I	5.98%	M	3.08%	Y	1.09%	Z	0.47%
А	12.16%	L	5.24%	P	2.89%	V	1.05%	Ñ	0.17%
0	9.20%	D	4.67%	В	1.49%	G	1.00%	X	0.14%
S	7.20%	T	4.60%	Н	1.18%	F	0.69%	K	0.11%
N	6.83%	U	4.69%	Q	1.11%	J	0.52%	W	0.04%
R	6 41%	\subset	3 87%						

For the purposes of cryptograms it is customary to treat n and ñ as distinct letters, but a and á are the same letter. Likewise for e and é, and i and í. In other words, all the accent marks get amputated when working with cryptograms. Also, while some older Spanish dictionaries consider ch, ll, and rr, to be their own letters—this has fallen out of modern usage. Accordingly, "burro" is considered as five letters: "b-u-r-r-o" and not as four letters "b-u-rr-o."

Timed question [100 Points]: Solve this Aristocrat which is a quote by Rene Descartes. When you have solved it, raise your hand so that the time can be recorded and the solution checked.

EKASCSGC SG ABH ZWSAB ABWA YHWVG AE WLBSHJHCHUA.

UEABSUN LWU RH VEUH PSABEQA BEKH WUV LEUZSVHULH.

		В)	D	E	F	U	H	Ι	כ	K	L	M	N	0	P	Q	R	S	Т	Ū	V	W	X	Y	Z
Freq	10	7	3		7		3	10		1	2	4		1		1	1	1	8		8	4	6		1	2
1																										

1) [175 Points] A message encrypted with the Affine Cipher using an alphabet of 26 characters has been intercepted. You have been told that the first two characters of the message are the letters **DE**. With that knowledge, what does this message say?

X	С	S	P	Y	F	Z	Z	R	U	I	H	Н	W	٧	U	ശ	W	F	R	U	P

2) [80 Points] Solve this Aristocrat which is a quote by Frank Lloyd Wright which is encoded using a K1 key.

Y'N UBB YS WUGMP MW AQQOYSX TUSXQPMFD HQUOMSD MFE

MW ERQ RUSTD MW WMMBD. BQE'D DEUPE HYER EJOQHPYEQPD.

<u>K1</u>	A	B	C	D	E	F	G	H	I	J	K	L	M	N	0	P	Q	R	S	T	U	V	W	X	Y	Z
Frequency	1	4		7	8	2	1	3		1			9	1	3	5	8	3	5	2	6		5	2	5	
Replacement																										

3) **[50 Points]** Using a code word of **WORK**, encode the following quote from Ralph Marston using the Vigenère cipher.

W	Н	A	Т	Y	0	Ū	D	0	Т	0	D	A	Y	С	Α	N

I	M	P	R	0	٧	E	A	L	L	Y	0	ט	R	T	0	M	0	R	R	0	W	S

4) [100 Points] Sir Arthur Conan Doyle offers this important advice about sleuthing. It has been encoded using the Vigenère cipher using a five letter word associated with Sherlock Holmes. You have been told that the 38th through the 43rd letters in the code (BIDBIX) is the word REMAIN. What does the message decode to?

P	N	M	I	P	P	Ū	0	P	Z		N	I	X	E	K	F	T	R	I	Z		N	P	Y	W	J
J	В	V	I	N	I	Α	D	I	M		F	R	В	I	D	В	I	X	W	E		P	M	K	X	K
										-											-					
F	R	R	S	N	J	M	Z	٧	F		С	Α	L	P	V	N	Ū	С	X	S		F	T	R	I	K

5) [100 Points] Using the words of the Gettysburg address encode this famous quote below by Abraham Lincoln using a running key cipher. For reference, the Gettysburg address is:

FOUR SCORE AND SEVEN YEARS AGO OUR FATHERS BROUGHT FORTH ON THIS CONTINENT, A NEW NATION, CONCEIVED IN LIBERTY, AND DEDICATED TO THE PROPOSITION THAT ALL MEN ARE CREATED EQUAL.

Y	C	2	Ū		С	Α	N	N	0	Т	E	S	С	A	Р	E		Т	Н	E		R	E	S	Р	0	N	S	I	В	I	L	I '	T	Y
																					_														
			- F								ı		7			_							-			i			_				1		_
0] :	F		Т	C) :	M	0	R	R	0	W		В	Y		E	7	V	Α	D]	[]	N	G		I	Т		T	0	D	Α	Y	<u>.</u>

6) [250 Points] Solve this Patristocrat which is a quote by W.B. Prescott which is encoded using a K1 key.

QUKUB MVUEJ DELJE ZJJUW VZJFK UNWKE

QJUMJ LJEVU WKEQJ UMJ

<u>K1</u>	A	B	C	D	E	F	G	H	I	J	K	L	M	N	0	P	Q	R	S	T	U	V	W	X	Y	Z
Frequency		1		1	6	1				10	4	2	3	1			3				8	3	3			2
Replacement																										