

The following tables might be useful during the event.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

AAAAA	A
AAAAB	B
AAABA	C
AAABB	D
AABAA	E
AABAB	F
AABBA	G
AABBB	H
ABAAA	I/J
ABAAB	K
ABABA	L
ABABB	M

ABBAA	N
ABBAB	O
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%	C	3.06%	G	1.96%	K	0.67%
T	9.25%	R	6.12%	U	2.71%	W	1.92%	X	0.19%
A	8.04%	H	5.49%	M	2.53%	Y	1.73%	J	0.16%
O	7.60%	L	4.14%	F	2.30%	B	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%
A	12.16%	L	5.24%	P	2.89%	V	1.05%	Ñ	0.17%
O	9.20%	D	4.67%	B	1.49%	G	1.00%	X	0.14%
S	7.20%	T	4.60%	H	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%	C	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.”

Famous Phrases

Gettysburg address:

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.

Declaration of Independence:

WHEN IN THE COURSE OF HUMAN EVENTS IT BECOMES NECESSARY FOR ONE PEOPLE TO DISSOLVE THE POLITICAL BANDS WHICH HAVE CONNECTED THEM WITH ANOTHER AND TO ASSUME AMONG THE POWERS OF THE EARTH, THE SEPARATE AND EQUAL STATION TO WHICH THE LAWS OF NATURE AND OF NATURE'S GOD ENTITLE THEM, A DECENT RESPECT TO THE OPINIONS OF MANKIND REQUIRES THAT THEY SHOULD DECLARE THE CAUSES WHICH IMPEL THEM TO THE SEPARATION.

Constitution of United States of America:

WE THE PEOPLE OF THE UNITED STATES, IN ORDER TO FORM A MORE PERFECT UNION, ESTABLISH JUSTICE, INSURE DOMESTIC TRANQUILITY, PROVIDE FOR THE COMMON DEFENSE, PROMOTE THE GENERAL WELFARE, AND SECURE THE BLESSINGS OF LIBERTY TO OURSELVES AND OUR POSTERITY, DO ORDAIN AND ESTABLISH THIS CONSTITUTION FOR THE UNITED STATES OF AMERICA.

MAGNA CARTA (In Latin):

JOHANNES DEI GRACIA REX ANGLIE, DOMINUS HIBERNIE, DUX NORMANNIE, AQUITANNIE ET COMES ANDEGAVIE, ARCHIEPISCOPI, EPISCOPI, ABBATIBUS, COMITIBUS, BARONIBUS, JUSTICIARIIS, FORESTARIIS, VICECOMITIBUS, PREPOSITIS, MINISTRIS ET OMNIBUS BALLIVIS ET FIDELIBUS SUIS SALUTEM.

Timed question [100 Points]: Solve this Aristocrat which is a quote by Claude Elwood Shannon an American electrical engineer and mathematician who has been called “the father of information theory”. When you have solved it, raise your hand so that the time can be recorded and the solution checked.

Y FYQONMYCK N DYLK PGKA PK PYMM XK DU JUXUDQ PGND

TUHQ NJK DU GOLNAQ. NAT Y NL JUUDYAH VUJ DGK

LNZGYAKQ.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Frequency	5		1	7		1	5	2		4	8	4	3	8	2	4	5			2	8	1		2	8	1
Replacement																										

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 last two letters are **FE**. With that knowledge, what does this message say?

O	C	C	W	S	M	N	N	Z	C	Z	Y	D	D	C	T	N	P	C	G	O	M	P	C	O	S	B	V	Y	B	C	

2) [300 Points] Solve this Patristocrat which is a quote by Elon Musk which is encoded using a K1 key and starts with the word **WHEN**.

EURZB KYRLU JZTJB JYHKI LNZLR ZKCTU MKCQK JLRDR

ZJSLU RKQQB NIRZK LJZMK CISND KI

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

3) [75 Points] The following encodes a phrase using a Baconian alphabet. What does it say?

Answer: _____

sée you rácing see you rácing sée yóu rácing
see you racing see yóu racing sée yóu rácing
see yóu rácing see you rácing sée yóu rácing
sée you racing see yóu rácing see yóu rácing
sée yóu rácing see yóu rácing sée you rácing
sée yóu racing sée yóu racing see yóu rácing
see yóu rácing see yóu racing seé yóu rácing
see yóu rácing see yóu rácing sée yóu rácing
sée yóu rácing

4) [150 Points] The following headlines appeared in the newspaper but in reality they are a Baconian encoded message where the some letters encode as one character and the others as another in a pattern. You know that the message starts out as EVER. What does the message decode to?

Answer: _____

Maria built movie house badly.

Super quick clock wrong.

Board loose since chase begun

Music buyer being movie extra.

Heavy urban tower built worse since Maria began visit.

5) [120 Points] The following has been encoded using a running key cipher against a famous document. What does it say?

E	J	T	A	J	X	V	G	I	J	S	I		I	H	U	,	X	M	H	K	V	I	H	V

M	R	R	,	X	J	G	N	U	R	L	R