

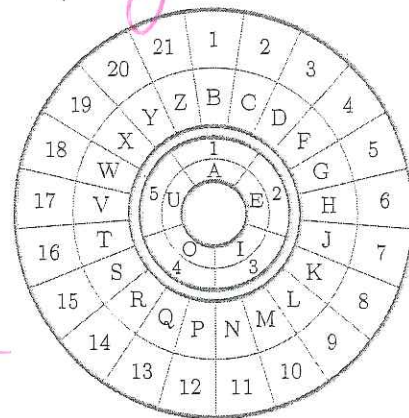
Mini-Exam 2

Name: \_\_\_\_\_

Key

1. Convert "betray" into numbers.

1, 2, 16, 14, 1, 20



2. What vowel goes with each number?

(a) 2

E

(b) 1022

E

(c) -2

$$\frac{+15}{3}$$

I

(d) -22

$$\frac{+25}{3}$$

I

3. What consonant goes with each number?

(a) 4

F

(b) 25

$$\frac{-21}{4}$$

F

(c) -3

$$\frac{+21}{18}$$

W

(d) -30

$$\frac{+21}{-9} \frac{+21}{12}$$

P

4. (a) Where does the shift by 2 cipher take betray?

3, 4, 18, 16, 3, 22 = 1

DOWTIB

(b) What was shifted by 2 to get RTIB?

14, 16, 3, 1  
-2 : 12 14 1, -1 = 20

P R A Y

5. (a) What shift turns betray into QOJGIN?

1

13

+12

(b) What shift turns betray into MEFCAK? (harder, explain your answer)

1

10

+9?

but vowels don't change

$$+9+21 = +30$$

6. A shift cipher was applied to a short English sentence to get E nuy caup fsa xaddura .

(a) How many words did the sentence have before it was encrypted?

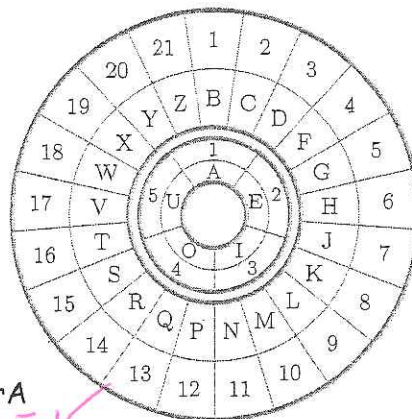
5 words

(b) How many letters did the first word have?

1 letter

(c) What was the first word (probably)?

I or A



(d) Figure out all the vowels: E nUy cAUp fsA xAddUrA

I A E I O U  
I E I O U A  
A U A E I O

I . A . . E A . . . E . E . . A . E  
A . O . . U O . . . U . U . . O . U

too strange, only .UO. is "Buoy"  
only .U is "Flu"  
or "Gnu"

(e) What are some (at least three) possibly keys that would work to encrypt the vowels?

secret Before A A c r A E I O U  
english Before E I O U A  
T-1, +4, +9  
+1, +6, +12, -4, etc

(f) Any guess on the fourth word?

After fsa 4 15 1  
↓ +1 5 16 2  
G T E  
↓ +6 10 21 2  
M Z E  
↓ +11 15 5 2  
S Q E  
↓ -4 21 11 2  
Z N E  
↓ -9 16 6 2  
T H E

(g) What did the message (probably) say?

After E nuy caup fsa xaddura  
2 11, 5, 20 2, 15, 12 4, 15, 1 14, 1, 3, 3, 5, 14, 1  
Before 3 2 1 11 14, 1, 3 16, 6, 2 10, 2, 15, 15, 1, 5, 2  
CAN READ THE MESSAGE  
I can read the message!

7. (a) Where does the double-it cipher take dog?

Before 3 4 5  
After H I M  
HIM

(b) The double-it cipher was applied to an English word to get DUDDX . What was the original word?

After D U D D X  
3 5 3 3 19  
= 24 = 10 = 14 = 24 = 40  
Before 12 5 12 12 20  
P U P P Y  
Puppy

Mini-Exam 2

Name: Key

1. Convert "subtly" into numbers.

S U B T L Y  
15, 5, 1, 16, 9, 20

2. What vowel goes with each number?

(a) 4

O

(b) 1025

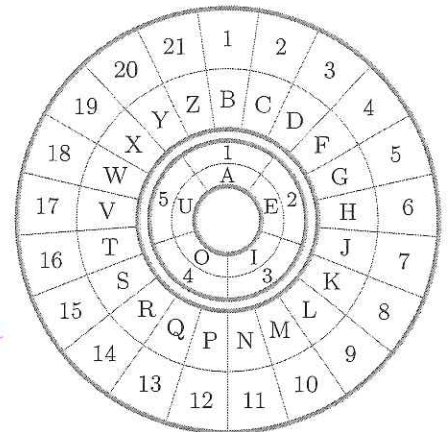
U

(c) -5

U

(d) -78

E



3. What consonant goes with each number?

(a) 2

C

(b) 22

B

(c) -2

X

(d) -22

Y

4. (a) Where does the shift by 3 cipher take subtly?

↓  
18, 3, 4, 19, 12, 2  
W I F X P C

(b) What was shifted by 3 to get RUBX?

After R U B X  
14 5 1 19  
Before -3 11 2 14 16  
N E X T

Next

5. (a) What shift turns subtly into JIRKBP?

Before 15, 5, 1, 16, 9, 20

After 7 3 14 8 1 12  
J I R K B P

Cons -8 or +13  
Vowel -2 or +3

+13 works for both

(b) What shift turns subtly into MUVNFS? (harder, explain your answer)

Before 15, 5, 1, 16, 9, 20

After 10 5 17 11 4 15  
M U V N F S

Cons -5 or +16

Vowels 0 or -5 or +5

-5 works for both



6. A shift cipher was applied to a short English sentence to get **A veidt kxu zup**.

(a) How many words did the sentence have before it was encrypted?

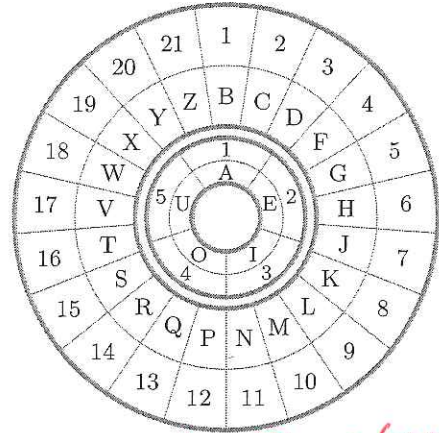
4 words

(b) How many letters did the first word have?

1 letter

(c) What was the first word (probably)?

A or I



(d) Figure out all the vowels: **A vEI dt kxU zUp**

A E I O U

A: A E I O U

A .EI.. ..U .U.

✓ I: I O U A E

I .OU.. ..E .E.

..U = Flu or Gnu. Probably not

(e) What are some (at least three) possibly keys that would work to encrypt the vowels?

✓ I: Encrypt -2, +3, +8, +13 Decrypt +2, -3, -8, -13

A: Encrypt +0, +5, +10, -5 Decrypt -0, -5, -10, +5

(f) Any guess on the third word?

Before K x u 8 19 5 | +2 10 21 2 M Z E | -3 5 16 2 G T E | -8 21 11 2 Z N E | -13 16 6 2 T H E

The

(g) What did the message (probably) say?

Before A veidt kx u zup 1 17, 2, 3, 16 8, 19, 5 21, 5, 12

-13 3 4, 4, 5, 11, 3 16, 6, 2 8, 2, 20

I FOUND THE KEY

I found the key

7. (a) Where does the double-it cipher take cat?

Before C A T 2 1 16 FEN

After 4 2 32=11

(b) The double-it cipher was applied to an English word to get **TANNX**. What was the original word?

Before T A N N X 16 1-6 11=32 11 19=40

Before 8, 3, 16, 16, 20 K I T T Y

Kitty

Mini-Exam 2

Name: Key

1. Convert "tricky" into numbers.

TRICKY  
16, 14, 3, 2, 8, 20

2. What vowel goes with each number?

(a) 3

I

(b) 88  $-85=3$

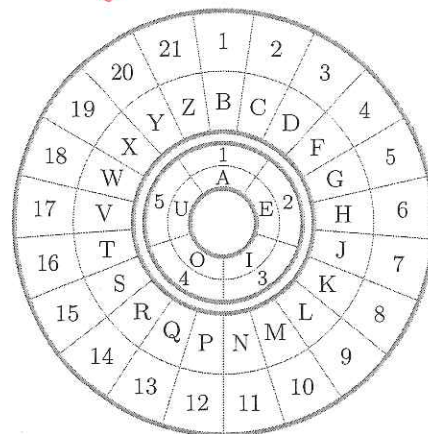
I

(c)  $-3+5=2$

E

(d)  $-88$

$\frac{+90}{2}$   
E



3. What consonant goes with each number?

(a) 8

K

(b) 28

$\frac{-21}{7}$   
J

(c)  $-8$

$\frac{+21}{13}$   
Q

(d)  $-28$

$\frac{+21}{-7}$   
 $\frac{+21}{14}$   
R

4. (a) Where does the shift by 4 cipher take tricky?

After 20, 18, 7=2, 6, 12, 24=3  
Y W E H P D

Ywehpd

- (b) What was shifted by 4 to get QOHPD?

After Q O H P D  
13 4 6 12 3  
Before 9 0=5 2 8 -1=20  
L U C K Y

Lucky

5. (a) What shift turns tricky into LJETBQ?

Before 16 14 3 2 8 20

After 9 7 2 16 1 13

Cons  $\downarrow -7$  or  $+14$

Vowel  $-1$  or  $+4$  or  $+9$  or  $+14$

$+14$  works for both

- (b) What shift turns tricky into RPIZHW? (harder, explain your answer)

Before 16 14 3 2 8 20

After 14 12 3 21 6 18

Cons  $\downarrow -2$  or  $+19$  or  $+40$  or  $+61$ ...

Vowel  $+0$  or  $+5$  or  $+10$  or  $+15$  or ...  $+40$

$+40$  works for both

6. A shift cipher was applied to a short English sentence to get **O eqir hvi ilez**.

(a) How many words did the sentence have before it was encrypted?

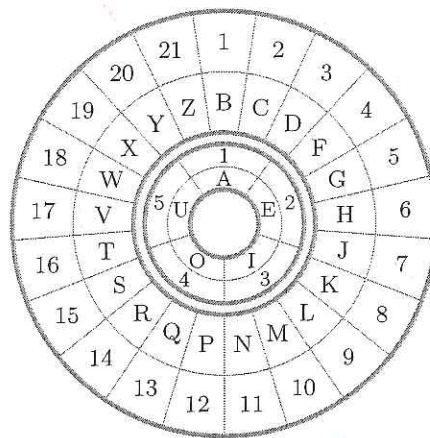
4 words

(b) How many letters did the first word have?

1 letter

(c) What was the first word (probably)?

A or I



(d) Figure out all the vowels: **O EqIr hvI ILEz**

AEIOU  
A : IOUA E A O.U. ..U U.O. U.O. doesn't seem like English  
\* I : U A E I O I A.E. ..E E.A. ??

(e) What are some (at least three) possibly keys that would work to encrypt the vowels?

A: Encrypt +3, +8, +13, -2 Decrypt -3, -8, -13, +2  
\* I: Encrypt +1, +6, +11, -4, -9, ... Decrypt -1, -6, -11, +4, +9

(f) Any guess on the third word? **h v I = 6, 17, 3**

~~7 18 4~~ ~~12 2 4~~ ~~5 16 2~~ ~~21 11 2~~ ~~16 6 2~~  
+1 I W O +6 G T E -6 Z N E -11 T H E  
The

(g) What did the message (probably) say?

After 4 2, 13, 3, 14 6, 17, 3 3, 9, 2, 21  
-11 3 1, 2, 2, 3 16, 6, 2 2, 19, 1, 10  
(+10 or Cons) I A C E D T H E E X A M  
I aced the exam.

7. (a) Where does the double-it cipher take cow?

Before C O W  
2 4 18  
After 4 3 15  
FIS

(b) The double-it cipher was applied to an English word to get **LPOOD**. What was the original word?

After L P O O D  
9 12 4 4 3  
=30 12 4 4 24  
Before 15 6 2 2 12  
S H E E P  
Sheep