Name_____ Period_____

Cipher Model Using Algebra

1. The following message was coded using the process c=p+4. Decipher the message.

   CSYV TEWWASVH LEW FIIR GLERKIH XS HSGXSVHIGSHIV.

2. The following message was coded using the process c=p+14. Decipher the message.

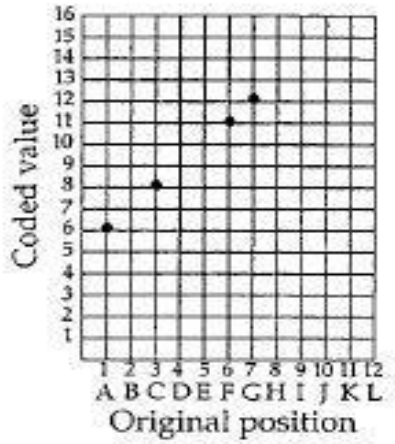
   PFWHWGV QFOQYWBU CT HVS USFAOB SBWUAO QCRS KOG O RSSQWRWBU TOQHCF WB KCFZR KOF HKC.

3. The following message was coded with the process c=p+9. Decipher the message.

   29 27 14 15 18 27 28 29 30 28 14 24 15 12 24 13 14 28 29 24 28 14 23 13 22 14 28 28 10 16 14 28 32 10 28 18 23 28 25 10 27 29 10 10 27 24 30 23 13 15 24 30 27 17 30 23 13 27 14 13 11 12

4. The following message was coded with the process c= p+20. Decipher the message.

   25 32 25 42 25 34 24 29 27 29 40 46 29 36 23 25 39 23 21 34 32 35 23 21 40 25 21 24 25 32 29 42 25 38 45 36 35 29 34 40 32 29 31 25 45 35 41 38 39 23 28 35 35 32 35 38 28 35 33 25 43 29 40 28 35 41 40 21 34 21 24 24 38 25 39 39



What is the equation that is modeled by this graph? _____

5. This message was coded with the process shown in the graph above:

   8 20 9 10 24 6 23 10 24 20 18 10 25 14 18 10 24 26 24 10 9 14 19 8 20 18 21 26 25 10 23 24 25 20 8 20 18 21 23 10 24 24 6 19 9 23 10 8 20 27 10 23 14 19 11 20 23 18 6 25 20 19

6. The table below represents the coding process for this message:
   46 18 24 24 16 10 24 32 50 30 42
   a) Find an equation that would fit for this process.
   b) Decode the message

Original Position	Coded Value
A	2
B	4
C	6
D	8
E	10

7. a) What coding process reverses the alphabet? That is, what is the equation that codes *A* as *Z, B* as *Y*, *C* as *X*, etc.?
   b) Is this a shift cipher?
   c) Is any letter left unchanged by this encoding process?
   d) How is the graph of this coding process different from the graph of a shift cipher like c=p+2?

Answer Key

1. YOUR PASSWORD HAS BEEN CHANGED TO DOCTOR DECODER
2. BRITISH CRACKING OF THE GERMAN ENIGMA CODE WAS A DECIDING FACTOR IN WORLD WAR TWO
3. THE FIRST USE OF THE CODES TO SEND MESSAGES WAS IN SPARTA AROUND FOUR HUNDRED BC
4. ELEVEN DIGIT ZIP CODES CAN LOCATE A DELIVERY POINT LIKE YOUR SCHOOL OR HOME WITHOUT AN ADDRESS
5. CODES ARE SOMETIMES USED IN COMPUTERS TO COMPRESS AND RECOVER IN FORMATION
6. WILL HELP YOU.

7. a. $c = 27 - p$
   b. It is not a shift.
   c. No. Each letter is changed.
   d. Different slope and y-intercept.