# TEXT MESSAGE DILEMMA!!          20 POINTS – 2 EACH
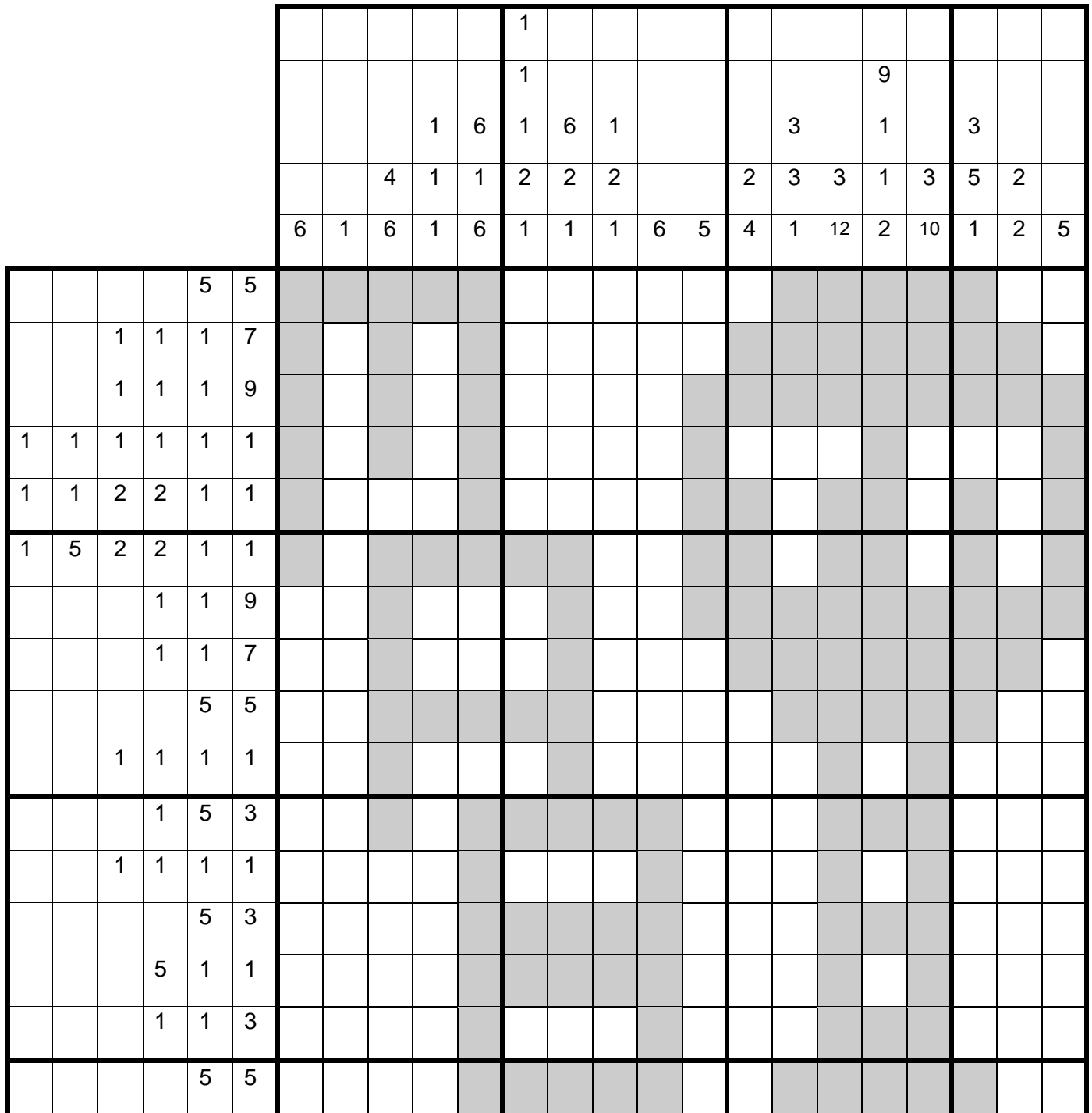
You and your MAΘ friends are text messaging mathematical words back and forth when your phone suddenly begins showing numerical messages instead of the text messages you expect. Can you decipher the messages your friends are sending?

1.    6284                _____MATH_____

2.    322867            _____FACTOR_____

3.    837839            _____VERTEX_____

4.    38537              _____EULER_____

5.    564274846      _____LOGARITHM____

6.    39766368        _____EXPONENT_____

7.    22734643        _____CARDIOID_____

8.    778273            _____SQUARE_____

9.    46834725        _____INTEGRAL____

10.   56442             _____LOGIC_____

## PAINT BY NUMBERS

This puzzle is a unique blend of logic and art.  The numbers above each column and to the left of each row tell you how many groups of black squares there are in that line and, in order, how many consecutive black squares there are in each group.  For example, 3 1 2 7 tells you that there are four groups that will contain , in order, 3, 1, 2, and 7 black squares.  Since they are separated, there will be at least one empty square between them.  There may also be empty squares at the beginning or end of each row or column.  The trick is to figure out how many empty squares come between the black ones.  When you finish, you will have a picture.

**Column clues (top):**

| c1 | c2 | c3 | c4 | c5 | c6 | c7 | c8 | c9 | c10 | c11 | c12 | c13 | c14 | c15 | c16 | c17 | c18 |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|    |    |    |    |    | 1  |    |    |    |     |     |     |     |     |     |     |     |     |
|    |    |    |    |    | 1  |    |    |    |     |     |     |     | 9   |     |     |     |     |
|    |    |    | 1  | 6  | 1  | 6  | 1  |    |     |     | 3   |     | 1   |     | 3   |     |     |
|    |    | 4  | 1  | 1  | 2  | 2  | 2  |    |     | 2   | 3   | 3   | 1   | 3   | 5   | 2   |     |
| 6  | 1  | 6  | 1  | 6  | 1  | 1  | 1  | 6  | 5   | 4   | 1   | 12  | 2   | 10  | 1   | 2   | 5   |

**Row clues (left):**

| | | | | | |
|---|---|---|---|---|---|
|   |   |   |   | 5 | 5 |
|   | 1 | 1 | 1 | 7 |   |
|   | 1 | 1 | 1 | 9 |   |
| 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 2 | 2 | 1 | 1 |
| 1 | 5 | 2 | 2 | 1 | 1 |
|   |   | 1 | 1 | 9 |   |
|   |   | 1 | 1 | 7 |   |
|   |   |   | 5 | 5 |   |
|   | 1 | 1 | 1 | 1 |   |
|   |   | 1 | 5 | 3 |   |
|   | 1 | 1 | 1 | 1 |   |
|   |   |   | 5 | 3 |   |
|   |   | 5 | 1 | 1 |   |
|   |   | 1 | 1 | 3 |   |
|   |   |   | 5 | 5 |   |

## SUNSPHERE WORD SEARCH – 2009 MAΘ    ANSWER = 1512

ALGEBRA
ANGLE
AREA
BOOLE
CALCULUS
CHORD
CIRCLE
COSINE
CURVE
DEGREE
DELTA
DERIVATIVE
DIAGONAL
DIVIDE
DOMAIN
ELLIPSE
EULER
FOUR
GEOMETRY
INTEGRATION
IRRATIONAL
KITE
LIMIT
LOCI
MATHEMATICS
MAXIMUM
MEAN
MEDIAN
MINIMUM
MU ALPHA THETA
PARABOLA
PLATO
POLAR
QUADRILATERAL
RADIAN
RANGE
RECTANGLE
SECANT
SECTOR
SIMPSON'S RULE
SIX
SLOPE
SQUARE
TANGENT
THEOREM
TORUS
TRIANGLE
TRIGONOMETRY
TWO
VECTOR
 YARD

**MULTIPLY FIVE HUNDRED BY THREE.  THEN ADD THE SQUARE ROOT OF ONE HUNDRED FORTY-FOUR TO GET THE ANSWER TO THIS WILD PUZZLE.**

**SUDOKU**          **SOLUTION**                    **20 POINTS**

This is a "squiggly " variation of Sudoku. Each outlined area consists of nine blocks and the digits 1 through 9 must appear in each section. As with the normal Sudoku, each of the nine digits also appears in each row and column.

| 2 | 5 | 4 | 7 | 8 | 3 | 6 | 1 | 9 |
|---|---|---|---|---|---|---|---|---|
| 8 | 9 | 3 | 1 | 7 | 4 | 5 | 2 | 6 |
| 3 | 1 | 6 | 2 | 9 | 5 | 4 | 7 | 8 |
| 4 | 8 | 9 | 5 | 2 | 1 | 3 | 6 | 7 |
| 1 | 7 | 5 | 4 | 6 | 9 | 2 | 8 | 3 |
| 6 | 2 | 1 | 8 | 3 | 7 | 9 | 5 | 4 |
| 9 | 4 | 8 | 6 | 5 | 2 | 7 | 3 | 1 |
| 7 | 6 | 2 | 3 | 4 | 8 | 1 | 9 | 5 |
| 5 | 3 | 7 | 9 | 1 | 6 | 8 | 4 | 2 |

This puzzle is worth **20 points**.

Since there are 57 blanks to fill in, **divide the number of incorrect values by 3 and round to the nearest integer** for the number to take off.

## CRYPTOGRAM PUZZLE #1        20 POINTS – 1 POINT PER BLANK

In the following equations, each number 0 through 9 has been replaced by a letter A-Z. The numbers have been replaced by the same letters in each of the three equations. Your job is to determine what the original equations are.

$$JXXT + MGGT = TDXJL$$

$$JXXT - MGGT = XGC$$

$$JXXT * MGGT = EECGMCJT$$

**SOLUTION:**
7881 + 6991 = 14872
7881 - 6991 = 890
7881 * 6991 = 55096071

Substitutions:

| | | | | |
|---|---|---|---|---|
| **C = 0** | **D = 4** | **E = 5** | **G = 9** | **J = 7** |
| **L = 2** | **M = 6** | **S = 3** | **T = 1** | **X = 8** |

## CRYPTOGRAM PUZZLE #2:

$$NMFW + RNXX = MMYMX$$

$$NMFW - RNXX = PFM$$

$$NMFW * RNXX = ZPYLLYYW$$

**SOLUTION:**
6120 + 5699 = 11819
6120 - 5699 = 421
6120 * 5699 = 34877880

Substitutions:

| | | | | |
|---|---|---|---|---|
| **F = 2** | **L = 7** | **M = 1** | **N = 6** | **P = 4** |
| **R = 5** | **W = 0** | **X = 9** | **Y = 8** | **Z = 3** |