# Locked Out Math: Dr. Medunefer's Riddle

## Contents

Welcome to Locked Out Math: Dr Medunefer's Riddle. This is a fun locked room experience that is Egyptian/archaeology/Indiana Jones themed. In the room students are searching for a lost archaeology professor who has run into some trouble. This locked room is designed for grade 8+ students, and I've found great success using it with grade 8-12 students. Some of the concepts students will need to solve the puzzles are listed below:

- Systems of equations (two by two systems up to four by four systems)

- Logic and Reasoning

- Pattern Recognition

The entire experience should take about 1-2 hours. Students often need some prompts to get started like "why are there exactly 26 characters here", "You need to find the starting point on the map", or "What's that beeping in the video?" There is also a scannable QR code on the map to the video/puzzles if students want to finish for homework.

## Instructions

The goal of the locked room is to discover Dr. Medunefer's coordinates on the map. This is done by finding the cell that corresponds with a correct solution for a row/column pair ($\partial = 15$). All the materials needed are listed below:

- **Description:** Describes the story. I recommend printing one large copy for everyone participating.

- **Map:** This is a map with that should be printed for each group participating (print on the backside of the description to save paper). This is the same map that is shown in the 'transmission video'. There is also a black and white (optional) map that can be used for scratch work by students.

- **Equations:** These must be solved in order to determine the starting point on the map. The cell with the correct number (row) corresponds with the correct symbol (column) is the starting point. There is a unique starting point.

- **Ciphers:** There are three ciphers used in this puzzle, two are alphanumeric (braille, and morse). Both are two rows of 13 corresponding to letters of the alphabet. The third links the alphabet with multiples of three.

- **Transmission Video**: This gives the transmission with provides the directions (left, right, down, up) to follow, and the morse code which translates to 'sum digits for final answer'. You can either put this on a TV, or stream to audio and print out maps.

- **Solutions:** Shows all the values for all systems of equations, and how the alphabet cipher works. It also shows the path taken on the map, and the final 'sum' answer.

# Dr. Medunefer's Riddle

Your mentor, Dr. Medunefer, has left on an expedition to unearth the fabled "Shrine of Akhethetep." He has left you an approximate map of the site his team has excavated and has radioed a message - they're in trouble. It appears their team has inadvertently sprung a booby trap and need your help. Dr. Medunefer estimates they have about an hour left until it's too late. However, to prevent the secret of the shrine from falling into the wrong hands, he has hidden the exact location within a code - he has ingeniously hidden instructions within his cry for help. You have one hour to decipher his message and locate the shrine.

| | ≫ | ⋒ | Ꮐ | ⊓ | ꝺ | ℧ | Ꙅ |
|---|---|---|---|---|---|---|---|
| ⠘ | 368 | 761 | 811 | 579 | 973 | 642 | 406 |
| ⠱ | 587 | 777 | 297 | 950 | 533 | 313 | 610 |
| ⠅ | 807 | 910 | 250 | 563 | 445 | 137 | 343 |
| ⠨ | 724 | 647 | 535 | 952 | 119 | 898 | 777 |
| ⠦ | 236 | 910 | 874 | 785 | 878 | 460 | 531 |
| ⠪ | 711 | 661 | 606 | 541 | 515 | 272 | 454 |
| ⠯ | 795 | 116 | 337 | 708 | 134 | 440 | 122 |

| | ≫ | ∩ | ⊃ | Ⅱ | ð | ℧ | ∽ |
|---|---|---|---|---|---|---|---|
| ⠒ | 720 | 701 | 551 | 623 | 505 | 344 | 256 |
| ⠌ | 666 | 169 | 329 | 949 | 509 | 434 | 377 |
| ⠄ | 494 | 457 | 411 | 946 | 274 | 919 | 825 |
| ⠈ | 974 | 964 | 768 | 779 | 747 | 618 | 139 |
| ⠢ | 965 | 194 | 819 | 913 | 407 | 251 | 478 |
| ⠔ | 674 | 834 | 367 | 969 | 130 | 476 | 678 |
| ⠦ | 997 | 360 | 847 | 330 | 639 | 860 | 397 |

$$5 \gg + 2\Upsilon + \tau = 8$$
$$2 \gg + 3\Upsilon + \tau = 6$$
$$3 \gg + 2\Upsilon + 2\tau = 7$$

$$5 \ \text{♏} + 10\gamma = 0$$
$$\text{♏} + 3\gamma = 0$$

$$2\eth + \heartsuit + \lambda + 2\mu = 51$$

$$3\eth + \heartsuit + 2\lambda + \mu = 62$$

$$4\eth + \heartsuit + \lambda + 3\mu = 88$$

$$\eth + \heartsuit + \lambda + \mu = 29$$

$$\breve{\partial} + \sigma = 2$$
$$4\sigma + 3\breve{\partial} = 8$$

$$2F + 3\square + 4\text{Ц} = 30$$
$$F + 2\square + 5\text{Ц} = 23$$
$$3F + 2\square + 2\text{Ц} = 27$$

$$4\Im + \triangle + 2\psi = 31$$
$$5\Im + 3\triangle + \psi = 37$$
$$2\Im + 7\triangle + \psi = 48$$

$$\chi + \alpha + \beta + \mho = 6$$
$$2\chi + \alpha + 3\beta + 5\mho = 18$$
$$3\chi + \alpha + 6\beta + \mho = 15$$
$$3\chi + 3\alpha + \beta + \mho = 12$$

$$A = |||$$
$$B = ||||||$$
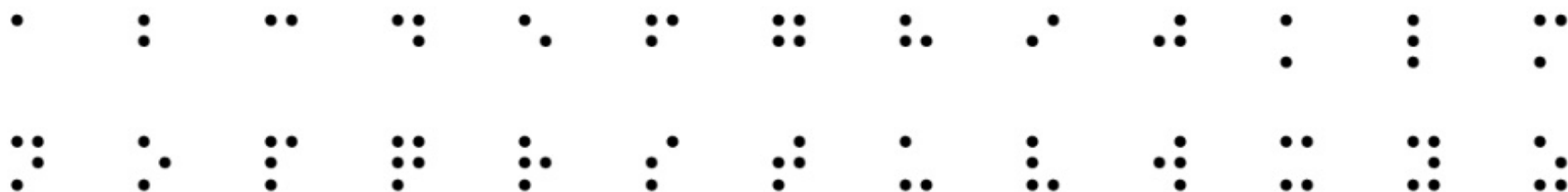$$\vdots$$
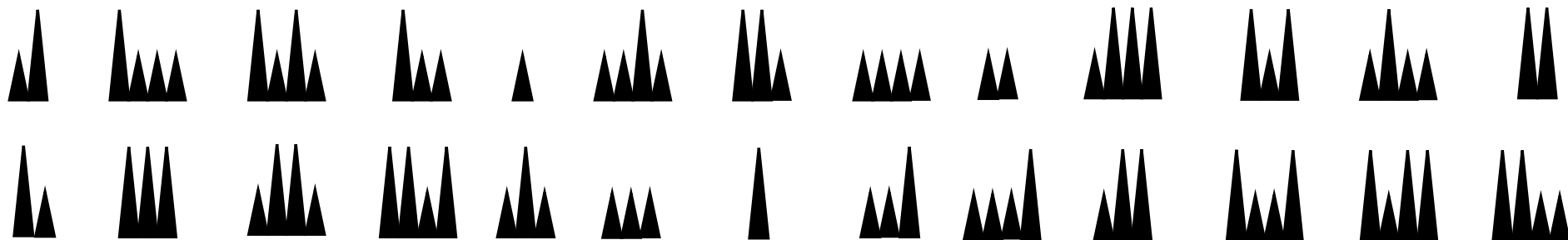$$F = \cap||||||||$$
$$\vdots$$
$$Z = \cap\cap\cap\cap\cap\cap\cap\cap||||||||||$$

can you read this
message in braille

$$\overset{0}{\eth} + \overset{2}{\sigma} = 2$$
$$4\sigma + 3\eth = 8$$

$$5\overset{0}{\text{⋔}} + 10\overset{0}{\gamma} = 0$$
$$\text{⋔} + 3\gamma = 0$$

$$5\overset{1}{\gg} + 2\overset{1}{\Upsilon} + \overset{1}{\tau} = 8$$
$$2\gg + 3\Upsilon + \tau = 6$$
$$3\gg + 2\Upsilon + 2\tau = 7$$

$$4\overset{3}{\Im} + \overset{5}{\triangle} + 2\overset{7}{\psi} = 31$$
$$5\Im + 3\triangle + \psi = 37$$
$$2\Im + 7\triangle + \psi = 48$$

$$2\overset{5}{F} + 3\overset{4}{\square} + 4\overset{2}{\text{II}} = 30$$
$$F + 2\square + 5\text{II} = 23$$
$$3F + 2\square + 2\text{II} = 27$$

$$\overset{2}{\chi} + \overset{1}{\alpha} + \overset{1}{\beta} + \overset{2}{\mho} = 6$$
$$2\chi + \alpha + 3\beta + 5\mho = 18$$
$$3\chi + \alpha + 6\beta + \mho = 15$$
$$3\chi + 3\alpha + \beta + \mho = 12$$

$$2\overset{15}{\eth} + \overset{4}{\heartsuit} + \overset{3}{\lambda} + 2\overset{7}{\mu} = 51$$
$$3\eth + \heartsuit + 2\lambda + \mu = 62$$
$$4\eth + \heartsuit + \lambda + 3\mu = 88$$
$$\eth + \heartsuit + \lambda + \mu = 29$$

Q=51

U=63

I=27

C=9

K=33

E=15

R=64

$3\ A = ||||$
$6\ B = ||||||$
$\vdots$
$18\ F = \cap||||||||$
$\vdots$
$78\ Z = \cap\cap\cap\cap\cap\cap\cap\cap\cap|||||||$

**FINAL ANSWER: 9+0+9+1=19**

**606+661+910+874+785+541+785+878+119+898+460+272+515+272+515=9091**

| | | | | | | |
|---|---|---|---|---|---|---|
| 579 | 973 | 642 | | | | 406 |
| 950 | 533 | 313 | | | | 610 |
| 807 | | | | | | 343 |
| 724 | 647 | 535 | 952 | 119 | 898 | 777 |
| 236 | 910 | 874 | 785 | 878 | 460 | 531 |
| 711 | 661 | 606 | 541 | 515 | 272 | 454 |
| 795 | 116 | 337 | 708 | 134 | 440 | 122 |

1  0  15  2  0  2  3