The Sunken Temple Cipher

Grade 8 math · Exponents, Square roots, Pythagorean theorem, Order of operations, Two-step equations · Reading level grades 7-9

Detective: _____ **Date:** _____

During a deep dive exploration, someone sabotaged the primary pressure vault at Station Atlantis II and stole the artifact map. Clues were left across the control decks.

1. Solve each math problem. The answer is a number, and the letter beside it is what that number stands for.
2. In the clue boxes, write that letter in every box showing the same number, then read the secret clue.
3. Use each clue to cross suspects off the list. The one suspect left at the end is the culprit!

My answer: the Saboteur is _____

Possible suspects

Cross off a row as each clue rules it out. The one left at the end is the culprit.

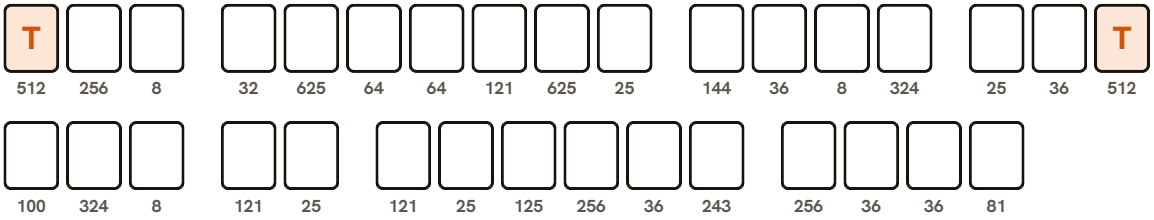
NAME	DIVING GEAR	SPECIALTY TOOL	GLOVE HABIT	WETSUIT HOOD	GOGGLES TINT
Submariner Jonah Finch	Sonar Cannon	Anchor Hook	Adjusts Right Cuff First	Cobalt Blue Hood	Clear UV Shield
Commander Rosa Mendez	Magmatic Jet	Grapple Winch	Adjusts Left Cuff First	Crimson Red Hood	Polarized Blue
Captain Samuel Vance	Bubble Shield	Laser Cutter	Adjusts Right Cuff First	Cobalt Blue Hood	Clear UV Shield
Operator Cleo Bennett	Bubble Shield	Grapple Winch	Adjusts Right Cuff First	Neon Yellow Hood	Polarized Blue
Tech Brody Hayes	Sonar Cannon	Sonic Scanner	Adjusts Right Cuff First	Crimson Red Hood	Clear UV Shield
Scout Maya Lin	Magmatic Jet	Grapple Winch	Adjusts Left Cuff First	Cobalt Blue Hood	Clear UV Shield
Explorer Victor Hugo	Sonar Cannon	Hydro Drill	Adjusts Right Cuff First	Cobalt Blue Hood	Clear UV Shield
Ranger Evan Ross	Trident Thruster	Anchor Hook	Adjusts Right Cuff First	Cobalt Blue Hood	Amber Filtered
Surveyor Finn Walsh	Magmatic Jet	Laser Cutter	Adjusts Right Cuff First	Crimson Red Hood	Amber Filtered
Cadet Eli Park	Bubble Shield	Anchor Hook	Adjusts Right Cuff First	Crimson Red Hood	Polarized Blue
Technician Cole Rivera	Bubble Shield	Sonic Scanner	Adjusts Right Cuff First	Neon Yellow Hood	Amber Filtered
Mechanic Zara Frost	Bubble Shield	Hydro Drill	Adjusts Right Cuff First	Cobalt Blue Hood	Clear UV Shield
Dr Elena Rostova	Trident Thruster	Hydro Drill	Adjusts Left Cuff First	Crimson Red Hood	Polarized Blue
Officer Sarah Blythe	Plasma Torch	Grapple Winch	Adjusts Right Cuff First	Cobalt Blue Hood	Clear UV Shield
Geologist Nina Vance	Trident Thruster	Anchor Hook	Adjusts Right Cuff First	Cobalt Blue Hood	Polarized Blue
Analyst Iris Thorne	Trident Thruster	Grapple Winch	Adjusts Right Cuff First	Neon Yellow Hood	Clear UV Shield
Diver Kai Tanaka	Trident Thruster	Grapple Winch	Adjusts Left Cuff First	Crimson Red Hood	Amber Filtered
Biologist Tara West	Plasma Torch	Anchor Hook	Adjusts Right Cuff First	Crimson Red Hood	Polarized Blue
Pilot Owen Cruz	Magmatic Jet	Laser Cutter	Adjusts Right Cuff First	Cobalt Blue Hood	Amber Filtered
Specialist Alex Reed	Plasma Torch	Grapple Winch	Adjusts Right Cuff First	Cobalt Blue Hood	Amber Filtered
Officer Liam Drake	Bubble Shield	Sonic Scanner	Adjusts Right Cuff First	Neon Yellow Hood	Polarized Blue

make your own at mathcrackers.com

CLUE 1 Exponents

> To calculate the exponential growth of subsea pressure on the vault door, you solve the exponent problems.

Solve each problem, then write its letter in every clue box that shows the same number.



2^9 = ☐ → T

5^3 = ☐ → C

4^3 = ☐ → L

2^3 = ☐ → E

5^4 = ☐ → I

12^2 = ☐ → D

16^2 = ☐ → H

5^2 = ☐ → N

3^5 = ☐ → R

10^2 = ☐ → U

2^5 = ☐ → V

18^2 = ☐ → S

11^2 = ☐ → A

3^4 = ☐ → K

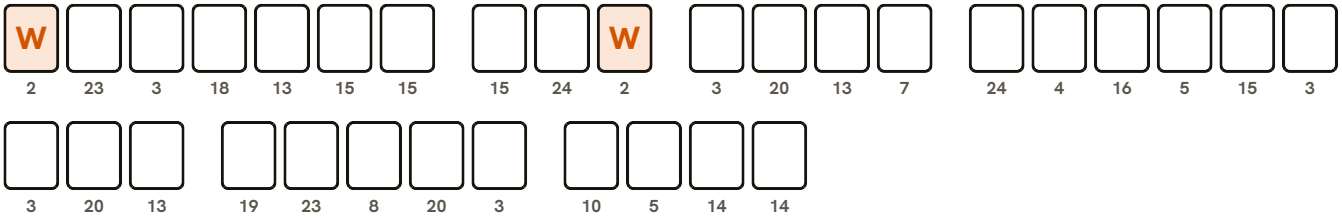
6^2 = ☐ → O

Scratch space:

CLUE 2 Square roots

Determining the exact side length of the square escape hatch requires computing square roots.

Solve each problem, then write its letter in every clue box that shows the same number.



sqrt(4) = ☐ → W

sqrt(169) = ☐ → E

sqrt(9) = ☐ → T

sqrt(361) = ☐ → R

sqrt(324) = ☐ → N

sqrt(100) = ☐ → C

sqrt(256) = ☐ → J

sqrt(64) = ☐ → G

sqrt(16) = ☐ → D

sqrt(25) = ☐ → U

sqrt(529) = ☐ → I

sqrt(225) = ☐ → S

sqrt(576) = ☐ → A

sqrt(400) = ☐ → H

sqrt(196) = ☐ → F

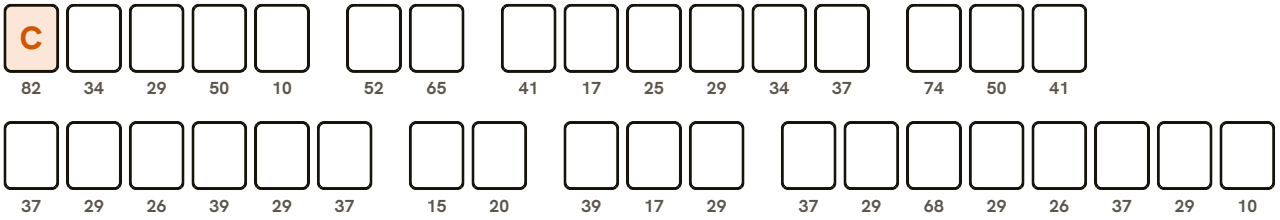
sqrt(49) = ☐ → M

Scratch space:

CLUE 3 Pythagorean theorem

Finding the direct distance along the ocean floor grid uses the Pythagorean theorem.

Solve each problem, then write its letter in every clue box that shows the same number.



legs 18 and 80, hypotenuse = ☐ → C

legs 10 and 24, hypotenuse = ☐ → N

legs 16 and 30, hypotenuse = ☐ → L

legs 24 and 70, hypotenuse = ☐ → W

legs 9 and 40, hypotenuse = ☐ → S

legs 32 and 60, hypotenuse = ☐ → F

legs 12 and 16, hypotenuse = ☐ → Y

legs 9 and 12, hypotenuse = ☐ → B

legs 6 and 8, hypotenuse = ☐ → R

legs 20 and 48, hypotenuse = ☐ → U

legs 15 and 20, hypotenuse = ☐ → I

legs 12 and 35, hypotenuse = ☐ → D

legs 20 and 21, hypotenuse = ☐ → E

legs 25 and 60, hypotenuse = ☐ → V

legs 8 and 15, hypotenuse = ☐ → H

legs 14 and 48, hypotenuse = ☐ → A

legs 15 and 36, hypotenuse = ☐ → T

Scratch space:

CLUE 4 Order of operations

Decoding the primary control console demands following the proper order of operations.

Solve each problem, then write its letter in every clue box that shows the same number.

B										B									
37	39	53	12	114	7	7	55	103	108	37	12	26	66	106	12	26	12		

66	47	45	25	25	12	55	7	47	114	53	39	39

27 + 5 × 2 = ☐ → B

31 + 5 × 7 = ☐ → S

19 + 2 × 3 = ☐ → G

88 + 6 × 3 = ☐ → W

21 + 8 × 4 = ☐ → U

2 × 11 - 15 = ☐ → O

5 × 10 - 5 = ☐ → A

30 + 3 × 3 = ☐ → L

7 × 4 - 2 = ☐ → R

4 × 9 - 24 = ☐ → E

11 × 10 - 2 = ☐ → I

63 + 5 × 8 = ☐ → F

34 + 7 × 3 = ☐ → D

89 + 5 × 5 = ☐ → H

7 + 8 × 5 = ☐ → N

Scratch space:

CLUE 5 Two-step equations - the last clue

To solve for the missing depth level on the station elevator, you solve two step equations.

First solve each problem. Then find each answer in the numbered list below and cross that sentence out. One sentence will be left - that is exactly what the villain did!

Step 1 - solve these:

6x + 8 = 74, x = ☐	2x + 9 = 13, x = ☐	5x + 7 = 32, x = ☐	6x + 2 = 74, x = ☐
5x + 12 = 17, x = ☐	6x + 4 = 58, x = ☐	4x + 10 = 34, x = ☐	3x + 3 = 15, x = ☐
3x + 2 = 23, x = ☐	2x + 12 = 32, x = ☐	3x + 10 = 34, x = ☐	

Step 2 - cross out the sentence with each answer:

1. The villain engaged the magmatic jet, then mapped the vault using a sonic scanner.
2. The villain deployed the bubble shield, then sliced the gate with a laser cutter.
3. The villain sparked the plasma torch, then hoisted the chest using a grapple winch.
4. The villain sparked the plasma torch, then secured the cargo with an anchor hook.
5. The villain fired the sonar cannon, then breached the wall with a hydro drill.
6. The villain deployed the bubble shield, then secured the cargo with an anchor hook.
7. The villain activated the trident thruster, then hoisted the chest using a grapple winch.
8. The villain fired the sonar cannon, then sliced the gate with a laser cutter.
9. The villain activated the trident thruster, then secured the cargo with an anchor hook.
10. The villain sparked the plasma torch, then breached the wall with a hydro drill.
11. The villain deployed the bubble shield, then breached the wall with a hydro drill.
12. The villain deployed the bubble shield, then mapped the vault using a sonic scanner.

TEACHER / PARENT

Answer Key

The Sunken Temple Cipher

Culprit: Officer Sarah Blythe

Plasma Torch · Grapple Winch · Adjusts Right Cuff First · Cobalt Blue Hood · Clear UV Shield

Trail: Start 21 → Clue 1 16 → Clue 2 12 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Exponents): "THE VILLAIN DOES NOT USE AN ANCHOR HOOK"

2^9 = 512 (T) · 5^3 = 125 (C) · 4^3 = 64 (L) · 2^3 = 8 (E) · 5^4 = 625 (I) · 12^2 = 144 (D) · 16^2 = 256 (H) · 5^2 = 25 (N) · 3^5 = 243 (R) · 10^2 = 100 (U) · 2^5 = 32 (V) · 18^2 = 324 (S) · 11^2 = 121 (A) · 3^4 = 81 (K) · 6^2 = 36 (O)

Clue 2 (Square roots): "WITNESS SAW THEM ADJUST THE RIGHT CUFF"

sqrt(4) = 2 (W) · sqrt(169) = 13 (E) · sqrt(9) = 3 (T) · sqrt(361) = 19 (R) · sqrt(324) = 18 (N) · sqrt(100) = 10 (C) · sqrt(256) = 16 (J) · sqrt(64) = 8 (G) · sqrt(16) = 4 (D) · sqrt(25) = 5 (U) · sqrt(529) = 23 (I) · sqrt(225) = 15 (S) · sqrt(576) = 24 (A) · sqrt(400) = 20 (H) · sqrt(196) = 14 (F) · sqrt(49) = 7 (M)

Clue 3 (Pythagorean theorem): "CLEAR UV SHIELD WAS DENTED BY THE DEFENDER"

legs 18 and 80, hypotenuse = 82 (C) · legs 10 and 24, hypotenuse = 26 (N) · legs 16 and 30, hypotenuse = 34 (L) · legs 24 and 70, hypotenuse = 74 (W) · legs 9 and 40, hypotenuse = 41 (S) · legs 32 and 60, hypotenuse = 68 (F) · legs 12 and 16, hypotenuse = 20 (Y) · legs 9 and 12, hypotenuse = 15 (B) · legs 6 and 8, hypotenuse = 10 (R) · legs 20 and 48, hypotenuse = 52 (U) · legs 15 and 20, hypotenuse = 25 (I) · legs 12 and 35, hypotenuse = 37 (D) · legs 20 and 21, hypotenuse = 29 (E) · legs 25 and 60, hypotenuse = 65 (V) · legs 8 and 15, hypotenuse = 17 (H) · legs 14 and 48, hypotenuse = 50 (A) · legs 15 and 36, hypotenuse = 39 (T)

Clue 4 (Order of operations): "BLUE HOOD FIBERS WERE SNAGGED ON HULL"

27 + 5 × 2 = 37 (B) · 31 + 5 × 7 = 66 (S) · 19 + 2 × 3 = 25 (G) · 88 + 6 × 3 = 106 (W) · 21 + 8 × 4 = 53 (U) · 2 × 11 - 15 = 7 (O) · 5 × 10 - 5 = 45 (A) · 30 + 3 × 3 = 39 (L) · 7 × 4 - 2 = 26 (R) · 4 × 9 - 24 = 12 (E) · 11 × 10 - 2 = 108 (I) · 63 + 5 × 8 = 103 (F) · 34 + 7 × 3 = 55 (D) · 89 + 5 × 5 = 114 (H) · 7 + 8 × 5 = 47 (N)

Clue 5 (Two-step equations): surviving statement is box 3 → Officer Sarah Blythe

6x + 8 = 74, x = 11 · 2x + 9 = 13, x = 2 · 5x + 7 = 32, x = 5 · 6x + 2 = 74, x = 12 · 5x + 12 = 17, x = 1 · 6x + 4 = 58, x = 9 · 4x + 10 = 34, x = 6 · 3x + 3 = 15, x = 4 · 3x + 2 = 23, x = 7 · 2x + 12 = 32, x = 10 · 3x + 10 = 34, x = 8