The Mystery of the Sunken Citadel

Grade 10 math · Pythagorean theorem, Square roots, Exponents, Order of operations · Reading level grades 3-4

Detective: _____ **Date:** _____

The golden sun stone has vanished from the Sunken Citadel! The Chief Explorer needs your help to trace clues across the island and catch the sneaky bandit leader.

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 bandit leader is _____

Possible suspects

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

NAME	PRIMARY GEAR	BONUS TOOL	HAND COVER	HAIR STYLE	DEFENSIVE ITEM
Wanderer Will	Grappling Hook	Brass Scope	Wears Gloves	Braided Red Hair	Bright Mirrors
Diver Jack	Glider Pack	Signal Flare	Bare Hands	Sleek Black Hair	Loud Whistles
Captain Avery	Glider Pack	Map Case	Bare Hands	Braided Red Hair	Bright Mirrors
Navigator Elena	Glider Pack	Rope Ladder	Wears Gloves	Braided Red Hair	Loud Whistles
Voyager Uri	Glider Pack	Brass Scope	Wears Gloves	Braided Red Hair	Water Sprays
Pioneer Tara	Torch Shield	Steel Pick	Wears Gloves	Curly Blonde Hair	Water Sprays
Seeker Xena	Grappling Hook	Map Case	Bare Hands	Braided Red Hair	Water Sprays
Guardian Vera	Torch Shield	Signal Flare	Wears Gloves	Curly Blonde Hair	Water Sprays
Ranger Clara	Glider Pack	Brass Scope	Wears Gloves	Braided Red Hair	Bright Mirrors
Lookout Maya	Compass Ring	Rope Ladder	Wears Gloves	Braided Red Hair	Bright Mirrors
Hunter Hugo	Glider Pack	Signal Flare	Wears Gloves	Braided Red Hair	Water Sprays
Sentry Kara	Glider Pack	Map Case	Wears Gloves	Curly Blonde Hair	Water Sprays
Traveler Sam	Smoke Bomb	Steel Pick	Bare Hands	Braided Red Hair	Bright Mirrors
Scout Bruno	Grappling Hook	Steel Pick	Wears Gloves	Braided Red Hair	Water Sprays
Cadet Nico	Torch Shield	Steel Pick	Wears Gloves	Braided Red Hair	Bright Mirrors
Tracker Diego	Glider Pack	Signal Flare	Wears Gloves	Sleek Black Hair	Bright Mirrors
Pilot Iris	Grappling Hook	Rope Ladder	Bare Hands	Sleek Black Hair	Bright Mirrors
Rover Rosa	Grappling Hook	Brass Scope	Bare Hands	Sleek Black Hair	Loud Whistles
Sailor Finn	Glider Pack	Map Case	Wears Gloves	Braided Red Hair	Bright Mirrors
Officer Opal	Smoke Bomb	Brass Scope	Bare Hands	Sleek Black Hair	Water Sprays
Explorer Grace	Compass Ring	Map Case	Wears Gloves	Sleek Black Hair	Bright Mirrors

CLUE 1 Pythagorean theorem

The island map shows a right triangle between two watchtowers and the vault entrance.

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

T																			
87	25	68	65	34	5	5	74	34	116	39	10	68	52	116	10	87			

17	74	125	125	58	74	51	74	26	17	74	52	68							

legs 60 and 63, hypotenuse = ☐ → T

legs 8 and 15, hypotenuse = ☐ → C

legs 24 and 70, hypotenuse = ☐ → A

legs 25 and 60, hypotenuse = ☐ → V

legs 40 and 42, hypotenuse = ☐ → Y

legs 16 and 30, hypotenuse = ☐ → I

legs 80 and 84, hypotenuse = ☐ → N

legs 15 and 36, hypotenuse = ☐ → D

legs 35 and 120, hypotenuse = ☐ → R

legs 20 and 48, hypotenuse = ☐ → S

legs 10 and 24, hypotenuse = ☐ → P

legs 6 and 8, hypotenuse = ☐ → O

legs 7 and 24, hypotenuse = ☐ → H

legs 32 and 60, hypotenuse = ☐ → E

legs 3 and 4, hypotenuse = ☐ → L

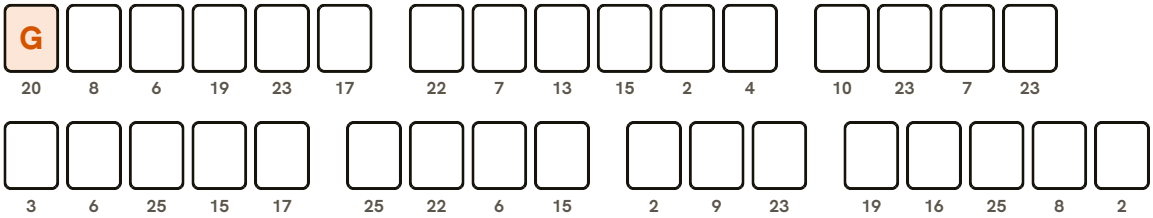
legs 24 and 45, hypotenuse = ☐ → M

Scratch space:

CLUE 2 Square roots

> The ancient chamber floor is a large square laid out in equal tile rows.

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



sqrt(400) = ☐ → G

sqrt(81) = ☐ → H

sqrt(625) = ☐ → U

sqrt(64) = ☐ → L

sqrt(361) = ☐ → V

sqrt(169) = ☐ → I

sqrt(225) = ☐ → N

sqrt(9) = ☐ → F

sqrt(484) = ☐ → P

sqrt(49) = ☐ → R

sqrt(36) = ☐ → O

sqrt(4) = ☐ → T

sqrt(16) = ☐ → S

sqrt(529) = ☐ → E

sqrt(100) = ☐ → W

sqrt(289) = ☐ → D

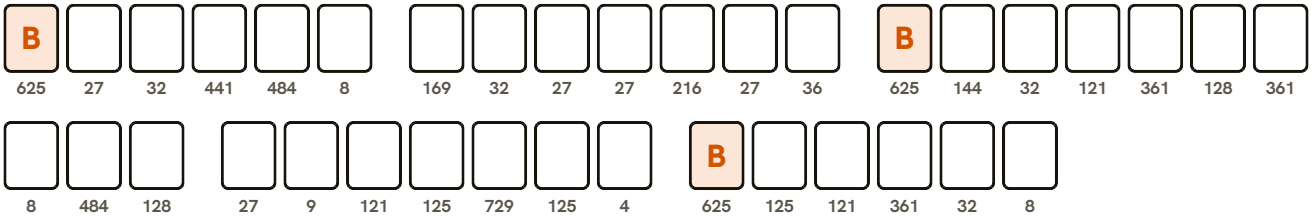
sqrt(256) = ☐ → A

Scratch space:

CLUE 3 Exponents

A glowing cave crystal multiplies its energy level during every hour of the night.

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



5^4 = ☐ → B

3^6 = ☐ → W

13^2 = ☐ → M

11^2 = ☐ → N

6^3 = ☐ → O

3^3 = ☐ → R

5^3 = ☐ → A

21^2 = ☐ → G

3^2 = ☐ → U

2^5 = ☐ → I

2^3 = ☐ → T

19^2 = ☐ → D

22^2 = ☐ → H

6^2 = ☐ → S

12^2 = ☐ → L

2^2 = ☐ → Y

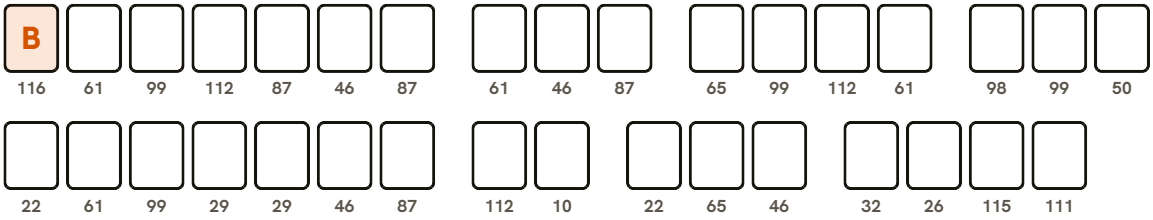
2^7 = ☐ → E

Scratch space:

CLUE 4 Order of operations

To solve the temple door mechanism, you must work through the symbols in order.

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



88 + 4 × 7 = ☐ → B

63 + 3 × 8 = ☐ → D

4 × 10 - 8 = ☐ → L

47 + 8 × 8 = ☐ → K

26 + 9 × 8 = ☐ → W

11 × 10 - 11 = ☐ → A

11 + 3 × 5 = ☐ → O

11 × 12 - 20 = ☐ → I

85 + 5 × 6 = ☐ → C

12 × 4 - 2 = ☐ → E

6 × 12 - 11 = ☐ → R

3 × 7 - 11 = ☐ → N

10 × 5 - 21 = ☐ → P

7 + 5 × 3 = ☐ → T

11 × 7 - 12 = ☐ → H

6 × 12 - 22 = ☐ → S

Scratch space:

CLUE 5 Square roots - the last clue

> The secret escape hatch is a square metal plate with equal side lengths.

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:

sqrt(36) = ☐ sqrt(100) = ☐ sqrt(121) = ☐ sqrt(9) = ☐ sqrt(144) = ☐

sqrt(81) = ☐ sqrt(25) = ☐ sqrt(64) = ☐ sqrt(4) = ☐ sqrt(1) = ☐

sqrt(49) = ☐

Step 2 - cross out the sentence with each answer:

1. The villain raised a torch shield, then adjusted a brass scope.
2. The villain flew a glider pack, then fired a signal flare.
3. The villain flew a glider pack, then chipped with a steel pick.
4. The villain flew a glider pack, then adjusted a brass scope.
5. The villain checked a compass ring, then opened a map case.
6. The villain checked a compass ring, then climbed a rope ladder.
7. The villain checked a compass ring, then adjusted a brass scope.
8. The villain flew a glider pack, then opened a map case.
9. The villain checked a compass ring, then fired a signal flare.
10. The villain raised a torch shield, then chipped with a steel pick.
11. The villain swung on a grappling hook, then adjusted a brass scope.
12. The villain threw a smoke bomb, then chipped with a steel pick.

TEACHER / PARENT

Answer Key

The Mystery of the Sunken Citadel

Culprit: Ranger Clara

Glider Pack · Brass Scope · Wears Gloves · Braided Red Hair · Bright Mirrors

Trail: Start 21 → Clue 1 16 → Clue 2 11 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "THE VILLAIN DOES NOT CARRY A MAP CASE"

legs 60 and 63, hypotenuse = 87 (T) · legs 8 and 15, hypotenuse = 17 (C) · legs 24 and 70, hypotenuse = 74 (A) · legs 25 and 60, hypotenuse = 65 (V) · legs 40 and 42, hypotenuse = 58 (Y) · legs 16 and 30, hypotenuse = 34 (I) · legs 80 and 84, hypotenuse = 116 (N) · legs 15 and 36, hypotenuse = 39 (D) · legs 35 and 120, hypotenuse = 125 (R) · legs 20 and 48, hypotenuse = 52 (S) · legs 10 and 24, hypotenuse = 26 (P) · legs 6 and 8, hypotenuse = 10 (O) · legs 7 and 24, hypotenuse = 25 (H) · legs 32 and 60, hypotenuse = 68 (E) · legs 3 and 4, hypotenuse = 5 (L) · legs 24 and 45, hypotenuse = 51 (M)

Clue 2 (Square roots): "GLOVED PRINTS WERE FOUND UPON THE VAULT"

sqrt(400) = 20 (G) · sqrt(81) = 9 (H) · sqrt(625) = 25 (U) · sqrt(64) = 8 (L) · sqrt(361) = 19 (V) · sqrt(169) = 13 (I) · sqrt(225) = 15 (N) · sqrt(9) = 3 (F) · sqrt(484) = 22 (P) · sqrt(49) = 7 (R) · sqrt(36) = 6 (O) · sqrt(4) = 2 (T) · sqrt(16) = 4 (S) · sqrt(529) = 23 (E) · sqrt(100) = 10 (W) · sqrt(289) = 17 (D) · sqrt(256) = 16 (A)

Clue 3 (Exponents): "BRIGHT MIRRORS BLINDED THE RUNAWAY BANDIT"

5^4 = 625 (B) · 3^6 = 729 (W) · 13^2 = 169 (M) · 11^2 = 121 (N) · 6^3 = 216 (O) · 3^3 = 27 (R) · 5^3 = 125 (A) · 21^2 = 441 (G) · 3^2 = 9 (U) · 2^5 = 32 (I) · 2^3 = 8 (T) · 19^2 = 361 (D) · 22^2 = 484 (H) · 6^2 = 36 (S) · 12^2 = 144 (L) · 2^2 = 4 (Y) · 2^7 = 128 (E)

Clue 4 (Order of operations): "BRAIDED RED HAIR WAS TRAPPED IN THE LOCK"

88 + 4 × 7 = 116 (B) · 63 + 3 × 8 = 87 (D) · 4 × 10 - 8 = 32 (L) · 47 + 8 × 8 = 111 (K) · 26 + 9 × 8 = 98 (W) · 11 × 10 - 11 = 99 (A) · 11 + 3 × 5 = 26 (O) · 11 × 12 - 20 = 112 (I) · 85 + 5 × 6 = 115 (C) · 12 × 4 - 2 = 46 (E) · 6 × 12 - 11 = 61 (R) · 3 × 7 - 11 = 10 (N) · 10 × 5 - 21 = 29 (P) · 7 + 5 × 3 = 22 (T) · 11 × 7 - 12 = 65 (H) · 6 × 12 - 22 = 50 (S)

Clue 5 (Square roots): surviving statement is box 4 → Ranger Clara

sqrt(36) = 6 · sqrt(100) = 10 · sqrt(121) = 11 · sqrt(9) = 3 · sqrt(144) = 12 · sqrt(81) = 9 · sqrt(25) = 5 · sqrt(64) = 8 · sqrt(4) = 2 · sqrt(1) = 1 · sqrt(49) = 7