Mystery of the Golden Scarab

Grade 10 math · Pythagorean theorem, Square roots, Exponents, Order of operations · Reading level grades 7-9

Detective: _____ **Date:** _____

A priceless golden scarab has vanished from the active dig site camp. The fresh tracks lead straight into the deep, trap-filled jungle ruins. You must use your mathematical mapping skills to find the rogue explorer before they escape the island.

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 rogue explorer is _____

Possible suspects

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

NAME	PRIMARY TOOL	SECONDARY GEAR	WRITING HAND	HAIR EVIDENCE	VULNERABILITY
Diana Cruz	Pocket Compass	Decoy Map	Right-handed	Brown Hair	Bright Flash
Paige Turner	Machete	Walkie Talkie	Right-handed	Black Hair	Slippery Mud
Wyatt Ridge	Pocket Compass	Walkie Talkie	Right-handed	Black Hair	Bright Flash
Eli Granger	Smoke Bomb	Binoculars	Right-handed	Black Hair	Bright Flash
Brooke Vance	Grappling Hook	Decoy Map	Left-handed	Blonde Hair	Loud Whistle
Hazel Croft	Smoke Bomb	Walkie Talkie	Left-handed	Black Hair	Slippery Mud
Chase Miller	Pocket Compass	Decoy Map	Right-handed	Brown Hair	Loud Whistle
Nadia Bell	Smoke Bomb	Binoculars	Left-handed	Black Hair	Slippery Mud
Toby Marsh	Smoke Bomb	Binoculars	Left-handed	Black Hair	Bright Flash
Grant Hayes	Grappling Hook	Binoculars	Left-handed	Black Hair	Bright Flash
Marcus Brody	Smoke Bomb	Binoculars	Right-handed	Blonde Hair	Loud Whistle
Ian Drake	Pocket Compass	Walkie Talkie	Right-handed	Brown Hair	Bright Flash
Victor Sullivan	Grappling Hook	Decoy Map	Right-handed	Black Hair	Bright Flash
Kaleb Vance	Pocket Compass	Climbing Spike	Right-handed	Black Hair	Bright Flash
Quinn Colby	Laser Pointer	Walkie Talkie	Right-handed	Brown Hair	Loud Whistle
Sienna West	Smoke Bomb	Decoy Map	Right-handed	Brown Hair	Bright Flash
Owen Rivers	Pocket Compass	Decoy Map	Right-handed	Black Hair	Bright Flash
Zoe Carter	Laser Pointer	Flashlight	Right-handed	Brown Hair	Loud Whistle
Rene Belloq	Machete	Flashlight	Left-handed	Blonde Hair	Bright Flash
Lara Finch	Smoke Bomb	Climbing Spike	Left-handed	Black Hair	Slippery Mud
Julia Jones	Grappling Hook	Walkie Talkie	Right-handed	Blonde Hair	Slippery Mud

CLUE 1 Pythagorean theorem

> To cross a treacherous ravine, we must calculate the exact length of the zipline rope connecting the tall mahogany tree to the cliff edge across the gap.

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

T																			T				
17	123	111	40	20	82	82	26	20	5	58	13	111	10	5	13	17							
30	10	111	29	82	20	51	74	20	5	52	10	85	20	25	111	10							

legs 8 and 15, hypotenuse = ☐ → T

legs 3 and 4, hypotenuse = ☐ → N

legs 5 and 12, hypotenuse = ☐ → O

legs 40 and 42, hypotenuse = ☐ → D

legs 20 and 48, hypotenuse = ☐ → G

legs 24 and 45, hypotenuse = ☐ → M

legs 10 and 24, hypotenuse = ☐ → A

legs 40 and 75, hypotenuse = ☐ → P

legs 6 and 8, hypotenuse = ☐ → S

legs 24 and 32, hypotenuse = ☐ → V

legs 18 and 24, hypotenuse = ☐ → U

legs 18 and 80, hypotenuse = ☐ → L

legs 27 and 120, hypotenuse = ☐ → H

legs 20 and 21, hypotenuse = ☐ → C

legs 36 and 105, hypotenuse = ☐ → E

legs 12 and 16, hypotenuse = ☐ → I

legs 7 and 24, hypotenuse = ☐ → K

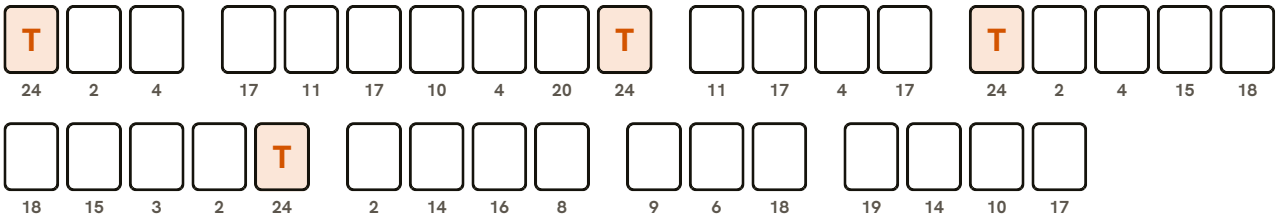
legs 24 and 70, hypotenuse = ☐ → B

Scratch space:

CLUE 2 Square roots

> We found a square tiled chamber floor in the ruins. Knowing the total area of the tiles helps us calculate the side length so we can step only on the safe path.

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



sqrt(576) = ☐ → T

sqrt(121) = ☐ → U

sqrt(361) = ☐ → M

sqrt(9) = ☐ → G

sqrt(196) = ☐ → A

sqrt(4) = ☐ → H

sqrt(289) = ☐ → S

sqrt(81) = ☐ → F

sqrt(100) = ☐ → P

sqrt(225) = ☐ → I

sqrt(16) = ☐ → E

sqrt(64) = ☐ → D

sqrt(400) = ☐ → C

sqrt(256) = ☐ → N

sqrt(324) = ☐ → R

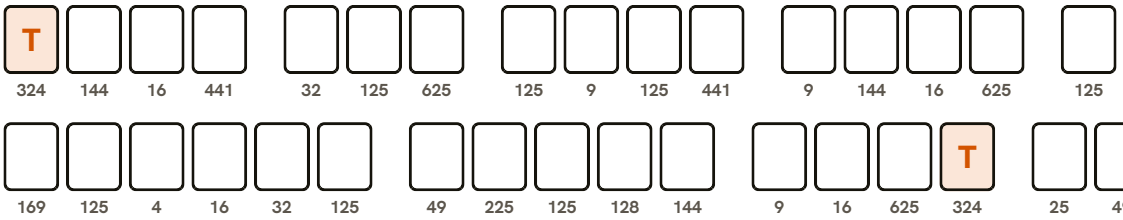
sqrt(36) = ☐ → O

Scratch space:

CLUE 3 Exponents

> A strange colony of glowing cave lichen doubles its size every hour. We must calculate how much it has multiplied over several hours to avoid getting trapped in the dark.

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



18^2 = ☐ → **T**

12^2 = ☐ → **H**

2^4 = ☐ → **E**

5^4 = ☐ → **N**

21^2 = ☐ → **Y**

5^3 = ☐ → **A**

2^7 = ☐ → **S**

2^5 = ☐ → **R**

3^2 = ☐ → **W**

2^2 = ☐ → **M**

13^2 = ☐ → **C**

15^2 = ☐ → **L**

5^2 = ☐ → **O**

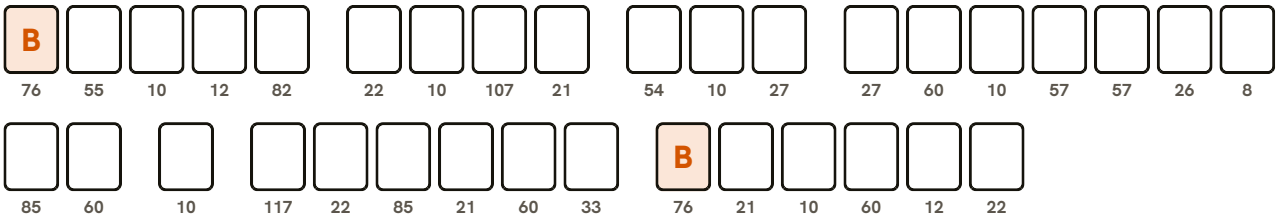
7^2 = ☐ → **F**

Scratch space:

CLUE 4 Order of operations

> The stone door lock requires us to press the sun, moon, and star glyphs in a precise mathematical order to disarm the poison dart trap.

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



13 + 7 × 9 = ☐ → B	12 × 7 - 24 = ☐ → N	6 × 6 - 24 = ☐ → C
11 × 6 - 11 = ☐ → L	7 × 4 - 2 = ☐ → E	41 + 8 × 2 = ☐ → G
13 + 7 × 2 = ☐ → S	4 × 11 - 22 = ☐ → H	3 + 3 × 6 = ☐ → R
36 + 9 × 9 = ☐ → T	60 + 5 × 5 = ☐ → O	3 × 4 - 2 = ☐ → A
12 × 5 - 27 = ☐ → Y	2 + 3 × 2 = ☐ → D	34 + 4 × 5 = ☐ → W
12 × 11 - 25 = ☐ → I	47 + 5 × 7 = ☐ → K	

Scratch space:

CLUE 5 Square roots - the last clue

> We need to scale down the dimensions of a perfectly square map grid. Finding the square root of the grid's sector count reveals the secret coordinate.

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(4) = ☐ sqrt(16) = ☐ sqrt(100) = ☐ sqrt(25) = ☐ sqrt(81) = ☐

sqrt(1) = ☐ sqrt(144) = ☐ sqrt(121) = ☐ sqrt(9) = ☐ sqrt(64) = ☐

sqrt(49) = ☐

Step 2 - cross out the sentence with each answer:

1. The villain hacked through thick vines with a machete, then pounded in a climbing spike.
2. The villain checked their pocket compass to find north, then dropped a decoy map to mislead the team.
3. The villain shined a laser pointer to distract the guard, then dropped a decoy map to mislead the team.
4. The villain tossed a smoke bomb to obscure the path, then scanned the horizon with binoculars.
5. The villain shined a laser pointer to distract the guard, then scanned the horizon with binoculars.
6. The villain checked their pocket compass to find north, then whispered into a walkie talkie.
7. The villain hacked through thick vines with a machete, then whispered into a walkie talkie.
8. The villain swung across the chasm using a grappling hook, then whispered into a walkie talkie.
9. The villain tossed a smoke bomb to obscure the path, then switched on a bright flashlight.
10. The villain swung across the chasm using a grappling hook, then dropped a decoy map to mislead the team.
11. The villain checked their pocket compass to find north, then scanned the horizon with binoculars.
12. The villain shined a laser pointer to distract the guard, then whispered into a walkie talkie.

TEACHER / PARENT

Answer Key

Mystery of the Golden Scarab

Culprit: Wyatt Ridge

Pocket Compass · Walkie Talkie · Right-handed · Black Hair · Bright Flash

Trail: Start 21 → Clue 1 19 → Clue 2 13 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "THE VILLAIN DOES NOT USE CLIMBING SPIKES"

legs 8 and 15, hypotenuse = 17 (T) · legs 3 and 4, hypotenuse = 5 (N) · legs 5 and 12, hypotenuse = 13 (O) · legs 40 and 42, hypotenuse = 58 (D) · legs 20 and 48, hypotenuse = 52 (G) · legs 24 and 45, hypotenuse = 51 (M) · legs 10 and 24, hypotenuse = 26 (A) · legs 40 and 75, hypotenuse = 85 (P) · legs 6 and 8, hypotenuse = 10 (S) · legs 24 and 32, hypotenuse = 40 (V) · legs 18 and 24, hypotenuse = 30 (U) · legs 18 and 80, hypotenuse = 82 (L) · legs 27 and 120, hypotenuse = 123 (H) · legs 20 and 21, hypotenuse = 29 (C) · legs 36 and 105, hypotenuse = 111 (E) · legs 12 and 16, hypotenuse = 20 (I) · legs 7 and 24, hypotenuse = 25 (K) · legs 24 and 70, hypotenuse = 74 (B)

Clue 2 (Square roots): "THE SUSPECT USES THEIR RIGHT HAND FOR MAPS"

sqrt(576) = 24 (T) · sqrt(121) = 11 (U) · sqrt(361) = 19 (M) · sqrt(9) = 3 (G) · sqrt(196) = 14 (A) · sqrt(4) = 2 (H) · sqrt(289) = 17 (S) · sqrt(81) = 9 (F) · sqrt(100) = 10 (P) · sqrt(225) = 15 (I) · sqrt(16) = 4 (E) · sqrt(64) = 8 (D) · sqrt(400) = 20 (C) · sqrt(256) = 16 (N) · sqrt(324) = 18 (R) · sqrt(36) = 6 (O)

Clue 3 (Exponents): "THEY RAN AWAY WHEN A CAMERA FLASH WENT OFF"

18^2 = 324 (T) · 12^2 = 144 (H) · 2^4 = 16 (E) · 5^4 = 625 (N) · 21^2 = 441 (Y) · 5^3 = 125 (A) · 2^7 = 128 (S) · 2^5 = 32 (R) · 3^2 = 9 (W) · 2^2 = 4 (M) · 13^2 = 169 (C) · 15^2 = 225 (L) · 5^2 = 25 (O) · 7^2 = 49 (F)

Clue 4 (Order of operations): "BLACK HAIR WAS SNAGGED ON A THORNY BRANCH"

13 + 7 × 9 = 76 (B) · 12 × 7 - 24 = 60 (N) · 6 × 6 - 24 = 12 (C) · 11 × 6 - 11 = 55 (L) · 7 × 4 - 2 = 26 (E) · 41 + 8 × 2 = 57 (G) · 13 + 7 × 2 = 27 (S) · 4 × 11 - 22 = 22 (H) · 3 + 3 × 6 = 21 (R) · 36 + 9 × 9 = 117 (T) · 60 + 5 × 5 = 85 (O) · 3 × 4 - 2 = 10 (A) · 12 × 5 - 27 = 33 (Y) · 2 + 3 × 2 = 8 (D) · 34 + 4 × 5 = 54 (W) · 12 × 11 - 25 = 107 (I) · 47 + 5 × 7 = 82 (K)

Clue 5 (Square roots): surviving statement is box 6 → Wyatt Ridge

sqrt(4) = 2 · sqrt(16) = 4 · sqrt(100) = 10 · sqrt(25) = 5 · sqrt(81) = 9 · sqrt(1) = 1 · sqrt(144) = 12 · sqrt(121) = 11 · sqrt(9) = 3 · sqrt(64) = 8 · sqrt(49) = 7