The Mystery of the Cretaceous Canopy

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

Detective: _____ **Date:** _____

A storm rolled over the fossil dig site last night, and someone breached the field vault! A priceless amber specimen containing ancient foliage DNA was taken from the lab display. Work through the field logs to catch the culprit.

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 Fossil Saboteur is _____

Possible suspects

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

NAME	DIG GEAR	FIELD GADGET	DOMINANT HAND	FIELD BADGE	DISTRACTION
Dr. Ian Malcolm	Laser Mapper	Flare Gun	Left Handed	Cobalt Badge	Flashlight Beams
Othniel Marsh	Sonic Chisel	Signal Booster	Right Handed	Bronze Badge	Loud Whistles
Barnum Brown	Drone Cam	Radio Collar	Right Handed	Amber Badge	Loud Whistles
Dong Zhiming	Laser Mapper	Night Visor	Right Handed	Amber Badge	Loud Whistles
Xu Xing	Drone Cam	Tracking Tag	Left Handed	Bronze Badge	Dust Clouds
Xu Li	Pneumatic Pick	Signal Booster	Right Handed	Cobalt Badge	Loud Whistles
Jack Horner	Pneumatic Pick	Radio Collar	Left Handed	Amber Badge	Flashlight Beams
Rodolfo Coria	Thermal Scanner	Radio Collar	Right Handed	Amber Badge	Dust Clouds
Steve Brusatte	Sonic Chisel	Night Visor	Left Handed	Bronze Badge	Dust Clouds
Paul Barrett	Pneumatic Pick	Tracking Tag	Right Handed	Amber Badge	Loud Whistles
Lindsay Zanno	Laser Mapper	Signal Booster	Right Handed	Amber Badge	Loud Whistles
Patricia Vickers-Rich	Laser Mapper	Radio Collar	Right Handed	Bronze Badge	Flashlight Beams
Dr. Ellie Sattler	Sonic Chisel	Radio Collar	Left Handed	Amber Badge	Loud Whistles
Roy Chapman Andrews	Pneumatic Pick	Signal Booster	Left Handed	Amber Badge	Flashlight Beams
Angela Milner	Pneumatic Pick	Night Visor	Left Handed	Amber Badge	Flashlight Beams
Luis Chiappe	Pneumatic Pick	Night Visor	Right Handed	Bronze Badge	Dust Clouds
Edward Cope	Laser Mapper	Signal Booster	Right Handed	Amber Badge	Dust Clouds
Karen Chin	Pneumatic Pick	Tracking Tag	Right Handed	Bronze Badge	Loud Whistles
Dr. Alan Grant	Drone Cam	Night Visor	Right Handed	Bronze Badge	Loud Whistles
Kristi Curry Rogers	Drone Cam	Night Visor	Right Handed	Amber Badge	Loud Whistles
Nizar Ibrahim	Sonic Chisel	Night Visor	Right Handed	Amber Badge	Dust Clouds

make your own at mathcrackers.com

CLUE 1 Pythagorean theorem

> To trace the saboteur's getaway path across the dig grid, the team measured perpendicular field legs to find the direct diagonal distance.

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

V																	
85	26	123	123	30	26	34	87	13	37	39	34	13	74	10	39	37	
74	17	30	58	15	26	34	29	74	30	29							

legs 40 and 75, hypotenuse = ☐ → V

legs 16 and 30, hypotenuse = ☐ → N

legs 8 and 15, hypotenuse = ☐ → R

legs 6 and 8, hypotenuse = ☐ → U

legs 12 and 35, hypotenuse = ☐ → E

legs 15 and 36, hypotenuse = ☐ → S

legs 60 and 63, hypotenuse = ☐ → D

legs 24 and 70, hypotenuse = ☐ → T

legs 5 and 12, hypotenuse = ☐ → O

legs 20 and 21, hypotenuse = ☐ → G

legs 27 and 120, hypotenuse = ☐ → L

legs 10 and 24, hypotenuse = ☐ → I

legs 18 and 24, hypotenuse = ☐ → A

legs 40 and 42, hypotenuse = ☐ → C

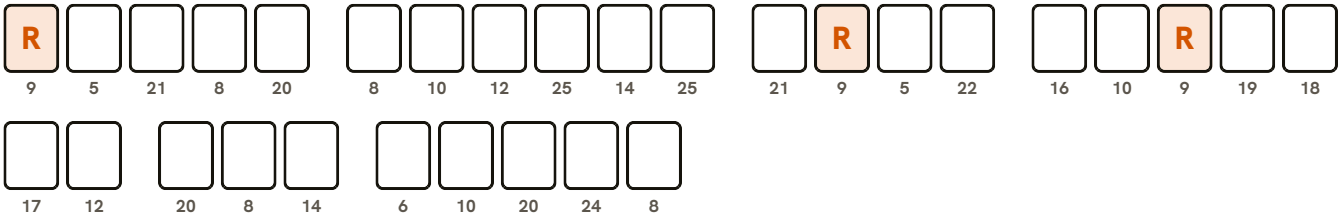
legs 9 and 12, hypotenuse = ☐ → K

Scratch space:

CLUE 2 Square roots

> The security team calculated the exact boundary length of a square excavation zone using its total area readout.

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



sqrt(81) = ☐ → R

sqrt(100) = ☐ → A

sqrt(324) = ☐ → S

sqrt(25) = ☐ → I

sqrt(400) = ☐ → T

sqrt(144) = ☐ → N

sqrt(441) = ☐ → G

sqrt(625) = ☐ → D

sqrt(289) = ☐ → O

sqrt(64) = ☐ → H

sqrt(361) = ☐ → K

sqrt(484) = ☐ → P

sqrt(196) = ☐ → E

sqrt(256) = ☐ → M

sqrt(36) = ☐ → L

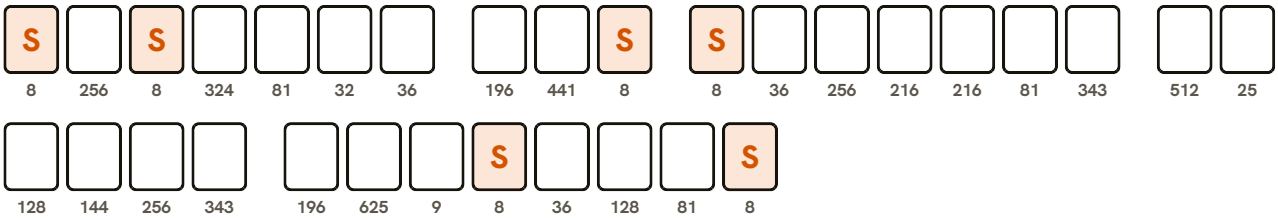
sqrt(576) = ☐ → C

Scratch space:

CLUE 3 Exponents

> Analyzing the exponential growth pattern of power surges in the lab's battery system gave the next encrypted location code.

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



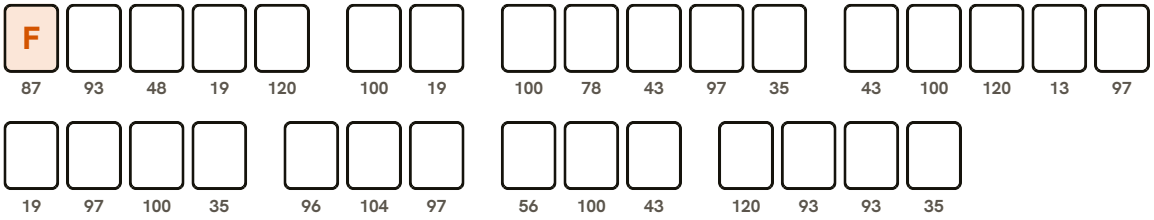
2^3 = ☐ → S	14^2 = ☐ → W	2^7 = ☐ → L	5^2 = ☐ → Y
6^2 = ☐ → T	18^2 = ☐ → P	7^3 = ☐ → D	6^3 = ☐ → N
21^2 = ☐ → A	3^2 = ☐ → I	5^4 = ☐ → H	16^2 = ☐ → U
2^9 = ☐ → B	12^2 = ☐ → O	2^5 = ☐ → C	3^4 = ☐ → E

Scratch space:

CLUE 4 Order of operations

Sorting through multi-step fossil inventory totals required solving the full sequence of operational priorities.

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



10 × 11 - 23 = ☐ → F

9 × 3 - 14 = ☐ → G

38 + 3 × 6 = ☐ → L

6 × 10 - 12 = ☐ → U

75 + 9 × 2 = ☐ → O

10 × 3 - 11 = ☐ → N

11 × 11 - 1 = ☐ → D

9 × 12 - 8 = ☐ → A

26 + 3 × 3 = ☐ → R

76 + 7 × 4 = ☐ → H

9 × 11 - 3 = ☐ → T

11 × 9 - 2 = ☐ → E

7 + 9 × 4 = ☐ → B

58 + 5 × 4 = ☐ → M

Scratch space:

CLUE 5 Square roots - the last clue

> Determining the side length of the square storage container from its surface area revealed the final security clue.

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(1) = ☐ sqrt(100) = ☐ sqrt(36) = ☐ sqrt(81) = ☐ sqrt(49) = ☐

sqrt(4) = ☐ sqrt(121) = ☐ sqrt(64) = ☐ sqrt(9) = ☐ sqrt(144) = ☐

sqrt(25) = ☐

Step 2 - cross out the sentence with each answer:

1. The villain cut the power lines, then took the crystalized egg.
2. The villain cracked the reinforced safe, then swiped the stegosaur bone.
3. The villain cut the power lines, then pocketed the raptor claw.
4. The villain unlocked the storage vault, then swiped the stegosaur bone.
5. The villain jammed the sonar radar, then took the crystalized egg.
6. The villain cut the power lines, then swiped the stegosaur bone.
7. The villain cut the power lines, then snatched the amber fossil.
8. The villain cut the power lines, then stole the apex predator tooth.
9. The villain jammed the sonar radar, then pocketed the raptor claw.
10. The villain unlocked the storage vault, then stole the apex predator tooth.
11. The villain unlocked the storage vault, then snatched the amber fossil.
12. The villain disabled the perimeter fence, then pocketed the raptor claw.

TEACHER / PARENT

Answer Key

The Mystery of the Cretaceous Canopy

Culprit: Kristi Curry Rogers

Drone Cam · Night Visor · Right Handed · Amber Badge · Loud Whistles

Trail: Start 21 → Clue 1 18 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "VILLAIN DOES NOT USE TRACKING TAG"

legs 40 and 75, hypotenuse = 85 (V) · legs 16 and 30, hypotenuse = 34 (N) · legs 8 and 15, hypotenuse = 17 (R) · legs 6 and 8, hypotenuse = 10 (U) · legs 12 and 35, hypotenuse = 37 (E) · legs 15 and 36, hypotenuse = 39 (S) · legs 60 and 63, hypotenuse = 87 (D) · legs 24 and 70, hypotenuse = 74 (T) · legs 5 and 12, hypotenuse = 13 (O) · legs 20 and 21, hypotenuse = 29 (G) · legs 27 and 120, hypotenuse = 123 (L) · legs 10 and 24, hypotenuse = 26 (I) · legs 18 and 24, hypotenuse = 30 (A) · legs 40 and 42, hypotenuse = 58 (C) · legs 9 and 12, hypotenuse = 15 (K)

Clue 2 (Square roots): "RIGHT HANDED GRIP MARKS ON THE LATCH"

sqrt(81) = 9 (R) · sqrt(100) = 10 (A) · sqrt(324) = 18 (S) · sqrt(25) = 5 (I) · sqrt(400) = 20 (T) · sqrt(144) = 12 (N) · sqrt(441) = 21 (G) · sqrt(625) = 25 (D) · sqrt(289) = 17 (O) · sqrt(64) = 8 (H) · sqrt(361) = 19 (K) · sqrt(484) = 22 (P) · sqrt(196) = 14 (E) · sqrt(256) = 16 (M) · sqrt(36) = 6 (L) · sqrt(576) = 24 (C)

Clue 3 (Exponents): "SUSPECT WAS STUNNED BY LOUD WHISTLES"

2^3 = 8 (S) · 14^2 = 196 (W) · 2^7 = 128 (L) · 5^2 = 25 (Y) · 6^2 = 36 (T) · 18^2 = 324 (P) · 7^3 = 343 (D) · 6^3 = 216 (N) · 21^2 = 441 (A) · 3^2 = 9 (I) · 5^4 = 625 (H) · 16^2 = 256 (U) · 2^9 = 512 (B) · 12^2 = 144 (O) · 2^5 = 32 (C) · 3^4 = 81 (E)

Clue 4 (Order of operations): "FOUND AN AMBER BADGE NEAR THE LAB DOOR"

10 × 11 - 23 = 87 (F) · 9 × 3 - 14 = 13 (G) · 38 + 3 × 6 = 56 (L) · 6 × 10 - 12 = 48 (U) · 75 + 9 × 2 = 93 (O) · 10 × 3 - 11 = 19 (N) · 11 × 11 - 1 = 120 (D) · 9 × 12 - 8 = 100 (A) · 26 + 3 × 3 = 35 (R) · 76 + 7 × 4 = 104 (H) · 9 × 11 - 3 = 96 (T) · 11 × 9 - 2 = 97 (E) · 7 + 9 × 4 = 43 (B) · 58 + 5 × 4 = 78 (M)

Clue 5 (Square roots): surviving statement is box 4 → Kristi Curry Rogers

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