The Case of the Golden Catnip Mouse

Grade 10 math · Pythagorean theorem, Multi-step word problems, Square roots, Exponents · Reading level grades 7-9

Detective: _____ **Date:** _____

The legendary Golden Catnip Mouse has been swiped from the Whisker City Vault! A mysterious feline thief slipped past the laser grids. Officer Whiskers needs your help to crack the clues, solve the math, and identify the culprit from the lineup.

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 Yarn Bandit is _____

Possible suspects

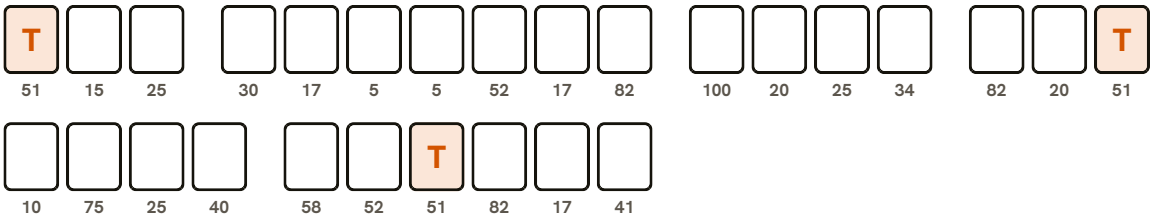
Cross off a row as each clue rules it out. The one left at the end is the culprit.

NAME	PRIMARY SKILL	SPECIAL UTILITY	DISTINGUISHING FEATURE	FUR PATTERN	KNOWN DETRACTOR
Tom Cat	High Leap	Yarn Spin	No collar bell	Calico fur	Crinkly foil
Oliver	High Leap	Catnip Brew	No collar bell	Sleek black coat	Water mist
Fluffy	Super Purr	Box Hide	Wears collar bell	Tabby stripes	Water mist
Socky	High Leap	Mouse Hunt	No collar bell	Tabby stripes	Water mist
Mittens	High Leap	Box Hide	No collar bell	Tabby stripes	Water mist
Boots	Night Vision	Catnip Brew	No collar bell	Tabby stripes	Vacuum noise
Sylvester	High Leap	Mouse Hunt	No collar bell	Calico fur	Crinkly foil
Garfield	Super Purr	Box Hide	No collar bell	Sleek black coat	Vacuum noise
Grumpy Cat	Super Purr	Catnip Brew	Wears collar bell	Sleek black coat	Vacuum noise
Salem	Super Purr	Yarn Spin	No collar bell	Calico fur	Crinkly foil
Mr Bigglesworth	Night Vision	Box Hide	Wears collar bell	Sleek black coat	Vacuum noise
Marie	Night Vision	Catnip Brew	No collar bell	Calico fur	Water mist
Paws	Super Purr	Catnip Brew	No collar bell	Tabby stripes	Water mist
Lil Bub	High Leap	Mouse Hunt	Wears collar bell	Calico fur	Crinkly foil
Nala	Super Purr	Mouse Hunt	Wears collar bell	Sleek black coat	Water mist
Cheshire	High Leap	Yarn Spin	No collar bell	Tabby stripes	Vacuum noise
Bob the Cat	Super Purr	Yarn Spin	Wears collar bell	Sleek black coat	Water mist
Maru	Silent Paws	Yarn Spin	Wears collar bell	Tabby stripes	Water mist
Sassy	Super Purr	Mouse Hunt	No collar bell	Calico fur	Water mist
Choupette	Night Vision	Laser Dodge	No collar bell	Tabby stripes	Water mist
Whiskers	Super Purr	Mouse Hunt	No collar bell	Tabby stripes	Water mist

CLUE 1 Pythagorean theorem

> We tracked the thief's escape route across several roofs. The security team had to calculate the total energy spent over three distinct climbs and two descents to find where they rested.

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



legs 24 and 45, hypotenuse = ☐ → T

legs 20 and 48, hypotenuse = ☐ → A

legs 24 and 32, hypotenuse = ☐ → W

legs 8 and 15, hypotenuse = ☐ → I

legs 40 and 42, hypotenuse = ☐ → C

legs 28 and 96, hypotenuse = ☐ → D

legs 15 and 20, hypotenuse = ☐ → E

legs 16 and 30, hypotenuse = ☐ → S

legs 21 and 72, hypotenuse = ☐ → R

legs 18 and 80, hypotenuse = ☐ → N

legs 9 and 12, hypotenuse = ☐ → H

legs 6 and 8, hypotenuse = ☐ → B

legs 18 and 24, hypotenuse = ☐ → V

legs 3 and 4, hypotenuse = ☐ → L

legs 9 and 40, hypotenuse = ☐ → P

legs 12 and 16, hypotenuse = ☐ → O

Scratch space:

CLUE 2 Multi-step word problems

> The suspect made a daring diagonal leap from the museum ledge directly to a high lamppost. We must calculate the straight-line distance of this jump using the wall height and ground distance.

Solve each problem, then write its letter in the boxes to fill in the missing word.

A witness saw the villain was

N									E		
11	12	85	12	47	47	40	86	10		47	47

.

There were 84 scratching posts in all. 40 scratching posts were set aside. The rest were shared equally among 4 Feline Patrol Unit. How many scratching posts did each get?

Answer: ☐ → **N**

There were 72 catnip treats in all. 24 catnip treats were set aside. The rest were shared equally among 4 Feline Patrol Unit. How many catnip treats did each get?

Answer: ☐ → **O**

There were 460 yarn balls in all. 2 Feline Patrol Unit used 15 yarn balls each. The other 5 Feline Patrol Unit shared the rest equally. How many yarn balls did each of the other Feline Patrol Unit get?

Answer: ☐ → **R**

There were 208 catnip treats in all. 8 catnip treats were set aside. The rest were shared equally among 5 Feline Patrol Unit. How many catnip treats did each get?

Answer: ☐ → **A**

Officer Whiskers filled 7 boxes with 4 feather wands each, then found 57 more feather wands. How many feather wands are there in all?

Answer: ☐ → **C**

There were 166 toy mice in all. 4 Feline Patrol Unit used 18 toy mice each. The other 2 Feline Patrol Unit shared the rest equally. How many toy mice did each of the other Feline Patrol Unit get?

Answer: ☐ → **L**

There were 67 toy mice in all. 3 Feline Patrol Unit used 9 toy mice each. The other 4 Feline Patrol Unit shared the rest equally. How many toy mice did each of the other Feline Patrol Unit get?

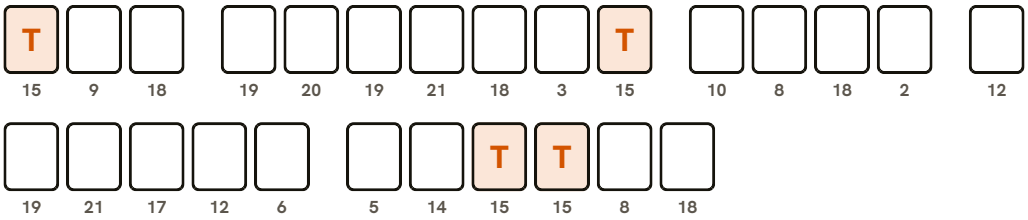
Answer: ☐ → **B**

Scratch space:

CLUE 3 Square roots

> A mysterious square patch of spilled catnip was left on the lawn. To find the length of the suspect's stride, we need to determine the side length of this perfectly square botanical mess.

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



sqrt(225) = ☐ → T

sqrt(324) = ☐ → E

sqrt(64) = ☐ → L

sqrt(81) = ☐ → H

sqrt(4) = ☐ → D

sqrt(100) = ☐ → F

sqrt(196) = ☐ → O

sqrt(441) = ☐ → P

sqrt(289) = ☐ → R

sqrt(144) = ☐ → A

sqrt(25) = ☐ → B

sqrt(36) = ☐ → Y

sqrt(9) = ☐ → C

sqrt(361) = ☐ → S

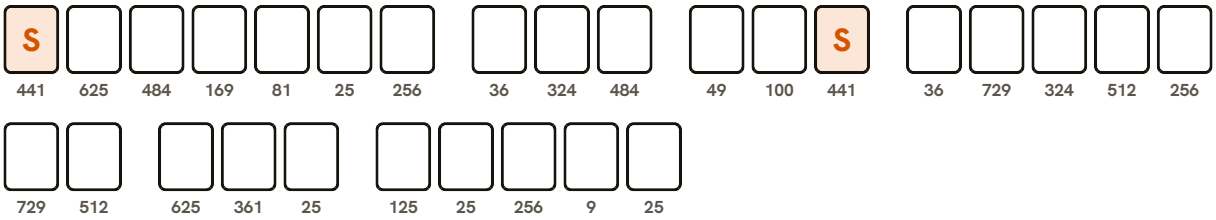
sqrt(400) = ☐ → U

Scratch space:

CLUE 4 Exponents

> The bandit left a trail of toy mice that doubles at every block they ran. We can predict their final destination by calculating the total mice dropped using exponential powers of two.

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



21^2 = ☐ → S	22^2 = ☐ → R	9^2 = ☐ → P	19^2 = ☐ → H
5^3 = ☐ → L	7^2 = ☐ → W	3^2 = ☐ → G	5^4 = ☐ → T
4^4 = ☐ → D	13^2 = ☐ → I	6^2 = ☐ → F	10^2 = ☐ → A
5^2 = ☐ → E	18^2 = ☐ → U	3^6 = ☐ → O	8^3 = ☐ → N

Scratch space:

CLUE 5 Square roots - the last clue

> The getaway vehicle was parked inside a fenced, square courtyard with a known area. Finding the perimeter will tell us how much tape we need to seal off the crime scene.

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(9) = ☐ sqrt(1) = ☐ sqrt(144) = ☐ sqrt(16) = ☐ sqrt(25) = ☐

sqrt(49) = ☐ sqrt(81) = ☐ sqrt(36) = ☐ sqrt(4) = ☐ sqrt(100) = ☐

sqrt(121) = ☐

Step 2 - cross out the sentence with each answer:

1. The villain leaped from the highest rafter, then hid inside an empty cardboard box.
2. The villain used night vision to navigate the dark, then spilled aromatic catnip on the floor.
3. The villain purred loudly to disrupt the alarms, then chased a toy mouse to escape.
4. The villain scaled the steep brick wall, then hid inside an empty cardboard box.
5. The villain padded silently across the floor, then chased a toy mouse to escape.
6. The villain used night vision to navigate the dark, then hid inside an empty cardboard box.
7. The villain padded silently across the floor, then hid inside an empty cardboard box.
8. The villain used night vision to navigate the dark, then dodged the security lasers with ease.
9. The villain purred loudly to disrupt the alarms, then dodged the security lasers with ease.
10. The villain scaled the steep brick wall, then dodged the security lasers with ease.
11. The villain purred loudly to disrupt the alarms, then spilled aromatic catnip on the floor.
12. The villain leaped from the highest rafter, then chased a toy mouse to escape.

TEACHER / PARENT

Answer Key

The Case of the Golden Catnip Mouse

Culprit: Choupette

Night Vision · Laser Dodge · No collar bell · Tabby stripes · Water mist

Trail: Start 21 → Clue 1 16 → Clue 2 10 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "THE VILLAIN DOES NOT BREW CATNIP"

legs 24 and 45, hypotenuse = 51 (T) · legs 20 and 48, hypotenuse = 52 (A) · legs 24 and 32, hypotenuse = 40 (W) · legs 8 and 15, hypotenuse = 17 (I) · legs 40 and 42, hypotenuse = 58 (C) · legs 28 and 96, hypotenuse = 100 (D) · legs 15 and 20, hypotenuse = 25 (E) · legs 16 and 30, hypotenuse = 34 (S) · legs 21 and 72, hypotenuse = 75 (R) · legs 18 and 80, hypotenuse = 82 (N) · legs 9 and 12, hypotenuse = 15 (H) · legs 6 and 8, hypotenuse = 10 (B) · legs 18 and 24, hypotenuse = 30 (V) · legs 3 and 4, hypotenuse = 5 (L) · legs 9 and 40, hypotenuse = 41 (P) · legs 12 and 16, hypotenuse = 20 (O)

Clue 2 (Multi-step word problems): "NO COLLAR BELL"

There were 84 scratching posts in all. 40 scratching posts were set aside. The rest were shared equally among 4 Feline Patrol Unit. How many scratching posts did each get? = 11 (N) · There were 72 catnip treats in all. 24 catnip treats were set aside. The rest were shared equally among 4 Feline Patrol Unit. How many catnip treats did each get? = 12 (O) · There were 460 yarn balls in all. 2 Feline Patrol Unit used 15 yarn balls each. The other 5 Feline Patrol Unit shared the rest equally. How many yarn balls did each of the other Feline Patrol Unit get? = 86 (R) · There were 208 catnip treats in all. 8 catnip treats were set aside. The rest were shared equally among 5 Feline Patrol Unit. How many catnip treats did each get? = 40 (A) · Officer Whiskers filled 7 boxes with 4 feather wands each, then found 57 more feather wands. How many feather wands are there in all? = 85 (C) · There were 166 toy mice in all. 4 Feline Patrol Unit used 18 toy mice each. The other 2 Feline Patrol Unit shared the rest equally. How many toy mice did each of the other Feline Patrol Unit get? = 47 (L) · There were 67 toy mice in all. 3 Feline Patrol Unit used 9 toy mice each. The other 4 Feline Patrol Unit shared the rest equally. How many toy mice did each of the other Feline Patrol Unit get? = 10 (B)

Clue 3 (Square roots): "THE SUSPECT FLED A SPRAY BOTTLE"

sqrt(225) = 15 (T) · sqrt(324) = 18 (E) · sqrt(64) = 8 (L) · sqrt(81) = 9 (H) · sqrt(4) = 2 (D) · sqrt(100) = 10 (F) · sqrt(196) = 14 (O) · sqrt(441) = 21 (P) · sqrt(289) = 17 (R) · sqrt(144) = 12 (A) · sqrt(25) = 5 (B) · sqrt(36) = 6 (Y) · sqrt(9) = 3 (C) · sqrt(361) = 19 (S) · sqrt(400) = 20 (U)

Clue 4 (Exponents): "STRIPED FUR WAS FOUND ON THE LEDGE"

21^2 = 441 (S) · 22^2 = 484 (R) · 9^2 = 81 (P) · 19^2 = 361 (H) · 5^3 = 125 (L) · 7^2 = 49 (W) · 3^2 = 9 (G) · 5^4 = 625 (T) · 4^4 = 256 (D) · 13^2 = 169 (I) · 6^2 = 36 (F) · 10^2 = 100 (A) · 5^2 = 25 (E) · 18^2 = 324 (U) · 3^6 = 729 (O) · 8^3 = 512 (N)

Clue 5 (Square roots): surviving statement is box 8 → Choupette

sqrt(9) = 3 · sqrt(1) = 1 · sqrt(144) = 12 · sqrt(16) = 4 · sqrt(25) = 5 · sqrt(49) = 7 · sqrt(81) = 9 · sqrt(36) = 6 · sqrt(4) = 2 · sqrt(100) = 10 · sqrt(121) = 11