



The Case of the Missing Ticonderogas

Grade 9 math · Two-step equations, Multi-step word problems, Exponents, Square roots · Reading level grades 7-9

Detective: _____ **Date:** _____

Right before the weekly pop quiz, Mrs. Gable discovered that her entire stash of premium, neon-hued, ultra-sharp pencils had vanished from the front of the room. A single mystery note was left in their place. Help us solve the equations to catch the culprit before the next class bell rings!

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 Pencil Bandit is _____

Possible suspects

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

NAME	DESK ALIBI	STASHED ITEM	WRITING HAND	HAIR STYLE	SQUEALER SOUND
Kai	borrowing an eraser	mesh side pocket	right handed writer	messy bun	squeaky sneaker scuff
Yara	borrowing an eraser	zippered pencil pouch	right handed writer	messy bun	squeaky sneaker scuff
Zane	borrowing an eraser	mesh side pocket	right handed writer	buzz cut	squeaky sneaker scuff
Devon	turning in a scratch paper	zippered pencil pouch	right handed writer	messy bun	pencil sharpener hum
Charlie	sharpening a colored pencil	giant winter boot	left handed writer	messy bun	velcro ripping sound
Wyatt	turning in a scratch paper	mesh side pocket	left handed writer	messy bun	velcro ripping sound
Val	asking for a bathroom pass	spiral notebook	right handed writer	messy bun	squeaky sneaker scuff
Jordan	asking for a bathroom pass	giant winter boot	right handed writer	messy bun	velcro ripping sound
Finley	stretching near the window	mesh side pocket	right handed writer	buzz cut	pencil sharpener hum
Logan	sharpening a colored pencil	spiral notebook	left handed writer	messy bun	pencil sharpener hum
Isaac	sharpening a colored pencil	giant winter boot	right handed writer	messy bun	pencil sharpener hum
Toby	asking for a bathroom pass	giant winter boot	left handed writer	buzz cut	pencil sharpener hum
Gavin	turning in a scratch paper	spiral notebook	right handed writer	messy bun	pencil sharpener hum
Sam	asking for a bathroom pass	mesh side pocket	left handed writer	messy bun	squeaky sneaker scuff
Taylor	stretching near the window	hollowed out textbook	right handed writer	ponytail	velcro ripping sound
Parker	stretching near the window	mesh side pocket	right handed writer	buzz cut	squeaky sneaker scuff
Alex	sharpening a colored pencil	hollowed out textbook	right handed writer	ponytail	squeaky sneaker scuff
Harper	sharpening a colored pencil	spiral notebook	right handed writer	messy bun	squeaky sneaker scuff
Morgan	borrowing an eraser	hollowed out textbook	right handed writer	messy bun	velcro ripping sound
Elliot	stretching near the window	giant winter boot	right handed writer	messy bun	squeaky sneaker scuff
Quinn	borrowing an eraser	hollowed out textbook	right handed writer	messy bun	pencil sharpener hum

CLUE 1
Two-step equations

Mrs. Gable needs to find out how many pencil packs were opened before the quiz. She counts the remaining boxes, multiplies by the pack size, and subtracts the damaged ones to reveal the first clue.

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

T				T											T						
14	13	22		14	13	11	22	12		10	11	10		2	20	14		13	11	10	22

T									T							T			
14	13	22	9		11	2		21	8	11	2	14	22	7		15	20	20	14

$7x + 1 = 99, x = \boxed{} \rightarrow \boxed{\text{T}}$

$8x + 7 = 23, x = \boxed{} \rightarrow \boxed{\text{N}}$

$7x + 11 = 88, x = \boxed{} \rightarrow \boxed{\text{I}}$

$5x + 8 = 43, x = \boxed{} \rightarrow \boxed{\text{R}}$

$3x + 1 = 28, x = \boxed{} \rightarrow \boxed{\text{M}}$

$5x + 10 = 120, x = \boxed{} \rightarrow \boxed{\text{E}}$

$5x + 9 = 49, x = \boxed{} \rightarrow \boxed{\text{W}}$

$3x + 9 = 48, x = \boxed{} \rightarrow \boxed{\text{H}}$

$5x + 2 = 52, x = \boxed{} \rightarrow \boxed{\text{D}}$

$2x + 6 = 48, x = \boxed{} \rightarrow \boxed{\text{A}}$

$5x + 4 = 79, x = \boxed{} \rightarrow \boxed{\text{B}}$

$9x + 8 = 188, x = \boxed{} \rightarrow \boxed{\text{O}}$

$9x + 5 = 113, x = \boxed{} \rightarrow \boxed{\text{F}}$

Scratch space:

CLUE 2

Multi-step word problems

To find the locker combination that holds the security footage, we must solve a formula matching the total weight of the textbooks plus a fixed locker key weight.

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

A witness saw the villain was

R									D	E	D	W	R			E	R
60	8	17	49	6	49	80	14					60	8	6		60	

There were 193 protractor in all. 1 Math Club used 13 protractor each. The other 3 Math Club shared the rest equally. How many protractor did each of the other Math Club get?

Answer: → **R**

There were 107 protractor in all. 2 Math Club used 28 protractor each. The other 3 Math Club shared the rest equally. How many protractor did each of the other Math Club get?

Answer: → **G**

Hall Monitor earned 8 pink eraser in each of 6 rounds, plus 44 bonus pink eraser. Then 12 pink eraser were lost. How many pink eraser are left?

Answer: → **A**

There were 330 pink eraser in all. 36 pink eraser were set aside. The rest were shared equally among 6 Math Club. How many pink eraser did each get?

Answer: → **H**

Hall Monitor collected 33 graphite pencil in the morning and 23 graphite pencil in the afternoon, then split them equally among 4 Math Club. How many graphite pencil did each get?

Answer: → **N**

There were 148 graphite pencil in all. 4 Math Club used 31 graphite pencil each. The other 3 Math Club shared the rest equally. How many graphite pencil did each of the other Math Club get?

Answer: → **I**

There were 22 protractor in all. 10 protractor were set aside. The rest were shared equally among 2 Math Club. How many protractor did each get?

Answer: → **T**

Scratch space:

CLUE 3 Exponents

The suspect ran down the hallway, leaving footprints that multiplied exponentially at each turn. Calculating the total growth rate gives us the next scrap of evidence.

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

T 9	625	225	T 9	625	49	225	64	289	125	128	225	8	225	512	T 9	625	225	49	8
225	169	8	441	169	T 9	T 9	625	225	441	121	144	225	169	400					

$3^2 = \square \rightarrow \text{T}$	$12^2 = \square \rightarrow \text{U}$	$2^3 = \square \rightarrow \text{R}$	$15^2 = \square \rightarrow \text{E}$
$8^2 = \square \rightarrow \text{F}$	$20^2 = \square \rightarrow \text{K}$	$2^7 = \square \rightarrow \text{V}$	$11^2 = \square \rightarrow \text{Q}$
$5^4 = \square \rightarrow \text{H}$	$5^3 = \square \rightarrow \text{O}$	$17^2 = \square \rightarrow \text{C}$	$13^2 = \square \rightarrow \text{A}$
$7^2 = \square \rightarrow \text{I}$	$8^3 = \square \rightarrow \text{D}$	$21^2 = \square \rightarrow \text{S}$	

Scratch space:

CLUE 4 Square roots

The principal wants to search a perfectly square section of the classroom floor tiles. Finding the side length of this area points directly to a hair clue.

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

A				A						A							A
10	12	18	4	10	8	22	2	3	6	10	21	4	3	4	2	11	10
								A									
11	19	12	12	17	25	15	8	23	10	12	3	2	15	8	22		

$\sqrt{100} = \square \rightarrow$ A	$\sqrt{36} = \square \rightarrow$ H	$\sqrt{484} = \square \rightarrow$ D
$\sqrt{16} = \square \rightarrow$ R	$\sqrt{144} = \square \rightarrow$ S	$\sqrt{625} = \square \rightarrow$ B
$\sqrt{324} = \square \rightarrow$ T	$\sqrt{121} = \square \rightarrow$ M	$\sqrt{289} = \square \rightarrow$ Y
$\sqrt{361} = \square \rightarrow$ E	$\sqrt{529} = \square \rightarrow$ W	$\sqrt{9} = \square \rightarrow$ F
$\sqrt{4} = \square \rightarrow$ O	$\sqrt{64} = \square \rightarrow$ N	$\sqrt{441} = \square \rightarrow$ I
$\sqrt{225} = \square \rightarrow$ U		

Scratch space:

CLUE 5**Two-step equations - the last clue**

The hall monitor tracks the hall pass usage. A simple two-step algebraic equation reveals exactly how many minutes the suspect was out of their seat.

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:

$3x + 12 = 33, x = \boxed{}$

$2x + 6 = 30, x = \boxed{}$

$8x + 3 = 75, x = \boxed{}$

$8x + 3 = 83, x = \boxed{}$

$9x + 8 = 107, x = \boxed{}$

$3x + 5 = 11, x = \boxed{}$

$7x + 11 = 39, x = \boxed{}$

$7x + 8 = 29, x = \boxed{}$

$5x + 9 = 49, x = \boxed{}$

$3x + 7 = 25, x = \boxed{}$

$2x + 7 = 17, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain crept to the front desk, then stuffed the graphite into a binder.
2. The villain snuck behind the teacher's podium, then concealed the pencils under a hall pass.
3. The villain distracted the front row, then stuffed the graphite into a binder.
4. The villain distracted the front row, then slipped the pencils under a notebook.
5. The villain waited for the lights to dim, then stuffed the graphite into a binder.
6. The villain snuck behind the teacher's podium, then slid the loot into a backpack pocket.
7. The villain waited for the lights to dim, then slid the loot into a backpack pocket.
8. The villain snuck behind the teacher's podium, then passed the pencils to an accomplice.
9. The villain tipped over the pencil cup, then stuffed the graphite into a binder.
10. The villain tipped over the pencil cup, then slipped the pencils under a notebook.
11. The villain waited for the lights to dim, then concealed the pencils under a hall pass.
12. The villain waited for the lights to dim, then passed the pencils to an accomplice.

Answer Key

The Case of the Missing Ticonderogas

Culprit: Harper

sharpening a colored pencil · spiral notebook · right handed writer · messy bun · squeaky sneaker scuff

Trail: Start 21 → Clue 1 16 → Clue 2 13 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Two-step equations): "THE THIEF DID NOT HIDE THEM IN A WINTER BOOT"

$7x + 1 = 99$, $x = 14$ (T) · $8x + 7 = 23$, $x = 2$ (N) · $7x + 11 = 88$, $x = 11$ (I) · $5x + 8 = 43$, $x = 7$ (R) · $3x + 1 = 28$, $x = 9$ (M) · $5x + 10 = 120$, $x = 22$ (E) · $5x + 9 = 49$, $x = 8$ (W) · $3x + 9 = 48$, $x = 13$ (H) · $5x + 2 = 52$, $x = 10$ (D) · $2x + 6 = 48$, $x = 21$ (A) · $5x + 4 = 79$, $x = 15$ (B) · $9x + 8 = 188$, $x = 20$ (O) · $9x + 5 = 113$, $x = 12$ (F)

Clue 2 (Multi-step word problems): "RIGHT HANDED WRITER"

There were 193 protractor in all. 1 Math Club used 13 protractor each. The other 3 Math Club shared the rest equally. How many protractor did each of the other Math Club get? = 60 (R) · There were 107 protractor in all. 2 Math Club used 28 protractor each. The other 3 Math Club shared the rest equally. How many protractor did each of the other Math Club get? = 17 (G) · Hall Monitor earned 8 pink eraser in each of 6 rounds, plus 44 bonus pink eraser. Then 12 pink eraser were lost. How many pink eraser are left? = 80 (A) · There were 330 pink eraser in all. 36 pink eraser were set aside. The rest were shared equally among 6 Math Club. How many pink eraser did each get? = 49 (H) · Hall Monitor collected 33 graphite pencil in the morning and 23 graphite pencil in the afternoon, then split them equally among 4 Math Club. How many graphite pencil did each get? = 14 (N) · There were 148 graphite pencil in all. 4 Math Club used 31 graphite pencil each. The other 3 Math Club shared the rest equally. How many graphite pencil did each of the other Math Club get? = 8 (I) · There were 22 protractor in all. 10 protractor were set aside. The rest were shared equally among 2 Math Club. How many protractor did each get? = 6 (T)

Clue 3 (Exponents): "THE THIEF COVERED THEIR EARS AT THE SQUEAK"

$3^2 = 9$ (T) · $12^2 = 144$ (U) · $2^3 = 8$ (R) · $15^2 = 225$ (E) · $8^2 = 64$ (F) · $20^2 = 400$ (K) · $2^7 = 128$ (V) · $11^2 = 121$ (Q) · $5^4 = 625$ (H) · $5^3 = 125$ (O) · $17^2 = 289$ (C) · $13^2 = 169$ (A) · $7^2 = 49$ (I) · $8^3 = 512$ (D) · $21^2 = 441$ (S)

Clue 4 (Square roots): "A STRAND OF HAIR FROM A MESSY BUN WAS FOUND"

$\sqrt{100} = 10$ (A) · $\sqrt{36} = 6$ (H) · $\sqrt{484} = 22$ (D) · $\sqrt{16} = 4$ (R) · $\sqrt{144} = 12$ (S) · $\sqrt{625} = 25$ (B) · $\sqrt{324} = 18$ (T) · $\sqrt{121} = 11$ (M) · $\sqrt{289} = 17$ (Y) · $\sqrt{361} = 19$ (E) · $\sqrt{529} = 23$ (W) · $\sqrt{9} = 3$ (F) · $\sqrt{4} = 2$ (O) · $\sqrt{64} = 8$ (N) · $\sqrt{441} = 21$ (I) · $\sqrt{225} = 15$ (U)

Clue 5 (Two-step equations): surviving statement is box 1 → Harper

$3x + 12 = 33$, $x = 7$ · $2x + 6 = 30$, $x = 12$ · $8x + 3 = 75$, $x = 9$ · $8x + 3 = 83$, $x = 10$ · $9x + 8 = 107$, $x = 11$ · $3x + 5 = 11$, $x = 2$ · $7x + 11 = 39$, $x = 4$ · $7x + 8 = 29$, $x = 3$ · $5x + 9 = 49$, $x = 8$ · $3x + 7 = 25$, $x = 6$ · $2x + 7 = 17$, $x = 5$