



The Case of the Missing Ruby

Grade 6 math · Percentages, Exponents, Order of operations, Multiplication, Division · Reading level grades 1-2

Detective: _____ Date: _____

The famous Crimson Ruby has vanished from its glass case! The room is locked. Who could have done it? The Mystery Club is on the case to find the master thief!

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 master thief is _____

Possible suspects

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

NAME	GEAR USED	CALLING CARD	WRITING HAND	HAIR COLOR	WEAKNESS
Hudson	laser pointer	silver coin	right handed	gray hair	allergic to cats
Gid	grappling hook	blue ribbon	left handed	dark hair	hates loud noises
Lupin	laser pointer	brass key	left handed	gray hair	hates loud noises
Watson	laser pointer	toy mouse	left handed	red hair	hates loud noises
Clouseau	spy camera	silver coin	left handed	dark hair	hates loud noises
Nancy	smoke bomb	feather pen	right handed	dark hair	hates loud noises
Nora	laser pointer	silver coin	left handed	gray hair	hates loud noises
Hardy	spy camera	toy mouse	left handed	gray hair	hates loud noises
Poirot	grappling hook	blue ribbon	right handed	gray hair	hates loud noises
Nick	laser pointer	brass key	right handed	dark hair	allergic to cats
Columbo	smoke bomb	silver coin	left handed	gray hair	hates loud noises
Velma	grappling hook	feather pen	left handed	red hair	hates loud noises
Marple	grappling hook	feather pen	left handed	gray hair	hates loud noises
Sherlock	smoke bomb	feather pen	left handed	red hair	hates loud noises
Monk	grappling hook	feather pen	left handed	dark hair	afraid of dark
Kojak	smoke bomb	brass key	right handed	red hair	allergic to cats
Holmes	laser pointer	silver coin	left handed	red hair	afraid of dark
Spade	smoke bomb	feather pen	left handed	red hair	allergic to cats
Moriarty	spy camera	feather pen	right handed	red hair	hates loud noises
Adler	grappling hook	silver coin	left handed	gray hair	afraid of dark
Drew	glass cutter	feather pen	left handed	gray hair	allergic to cats

CLUE 1

The team finds a chart of clues. Some clues are still missing. We must find the percent of clues we have left.

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

Diagram showing two rows of boxes with numbers and letters.

Top row (18 boxes):

- Box 1: T (orange background)
- Box 2: (empty)
- Box 3: (empty)
- Box 4: (empty)
- Box 5: (empty)
- Box 6: (empty)
- Box 7: (empty)
- Box 8: (empty)
- Box 9: (empty)
- Box 10: (empty)
- Box 11: (empty)
- Box 12: (empty)
- Box 13: (empty)
- Box 14: (empty)
- Box 15: (empty)
- Box 16: (empty)
- Box 17: (empty)
- Box 18: T (orange background)

Bottom row (15 boxes):

- Box 1: (empty)
- Box 2: (empty)
- Box 3: (empty)
- Box 4: (empty)
- Box 5: (empty)
- Box 6: (empty)
- Box 7: (empty)
- Box 8: (empty)
- Box 9: (empty)
- Box 10: (empty)
- Box 11: (empty)
- Box 12: (empty)
- Box 13: (empty)
- Box 14: (empty)
- Box 15: (empty)

Numbers below the boxes:

Top row numbers (from left to right): 43, 12, 9, 7, 3, 39, 39, 20, 3, 22, 32, 13, 9, 34, 22, 13, 43.

Bottom row numbers (from left to right): 32, 24, 13, 37, 20, 21, 24, 20, 34, 34, 31, 9, 27.

20% of 215 = → **T**

10% of 310 = → **K**

25% of 48 = $\rightarrow$ **H**

50% of 48 = $\rightarrow$ **R**

10% of 270 = → **Y**

20% of 15 = $\rightarrow$

75% of 12 = → **E**

25% of 156 = → **L**

10% of 70 = $\rightarrow$ **V**

10% of 220 = → **N**

5% of 420 = $\rightarrow$ **B**

50% of 40 = $\rightarrow$ **A**

50% of 68 = $\rightarrow$ **S**

5% of 260 = $\rightarrow$

5% of 640 = → **D**

25% of 148 = $\rightarrow$ **P**

Scratch space:

CLUE 2 Exponents

A secret safe has a digital keypad. The power levels grow very fast. Solve the math box to unlock the door.

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

T									T				T					T	
100	64	196	125	9	125	243	196	343	100	32	225	169	100	196	125	32	169	100	64

T								T				
100	64	196	169	225	361	196	216	100	64	128	27	324

$10^2 = \square \rightarrow$ T	$3^5 = \square \rightarrow$ P	$3^3 = \square \rightarrow$ N	$18^2 = \square \rightarrow$ D
$3^2 = \square \rightarrow$ U	$7^3 = \square \rightarrow$ C	$2^5 = \square \rightarrow$ W	$19^2 = \square \rightarrow$ L
$6^3 = \square \rightarrow$ F	$2^7 = \square \rightarrow$ A	$14^2 = \square \rightarrow$ E	$4^3 = \square \rightarrow$ H
$13^2 = \square \rightarrow$ I	$15^2 = \square \rightarrow$ R	$5^3 = \square \rightarrow$ S	

Scratch space:

CLUE 3
Order of operations

To open the heavy wooden desk, you must pull the drawers in a special order. Solve this puzzle to get the steps.

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

T			T															
67	15	11	67	15	18	11	65	28	54	40	54	30	54	10	65	28	80	20
T																		
67	15	11	66	80	29	78	9	11	66	66								

$8 \times 9 - 5 = \square \rightarrow \text{T}$

$8 \times 10 - 15 = \square \rightarrow \text{F}$

$11 \times 9 - 21 = \square \rightarrow \text{D}$

$12 + 2 \times 9 = \square \rightarrow \text{W}$

$3 + 2 \times 4 = \square \rightarrow \text{E}$

$1 + 2 \times 4 = \square \rightarrow \text{B}$

$8 + 4 \times 8 = \square \rightarrow \text{N}$

$12 \times 5 - 6 = \square \rightarrow \text{A}$

$44 + 4 \times 9 = \square \rightarrow \text{O}$

$6 + 2 \times 2 = \square \rightarrow \text{Y}$

$5 \times 8 - 12 = \square \rightarrow \text{R}$

$1 + 4 \times 7 = \square \rightarrow \text{U}$

$6 + 7 \times 2 = \square \rightarrow \text{M}$

$6 + 2 \times 6 = \square \rightarrow \text{I}$

$51 + 3 \times 5 = \square \rightarrow \text{L}$

$5 \times 4 - 5 = \square \rightarrow \text{H}$

Scratch space:

CLUE 4

Multiplication facts (1-12)

We count rows of muddy footprints on the rug. Let us multiply the rows to find the total number of prints.

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

W																		
66	88	40	24	7	108	2	132	25	15	54	20	88	28	16	81	28	132	16

									W			
110	132	15	28	24	108	96	110	88	66	132	54	54

$11 \times 6 = \square \rightarrow \boxed{\text{W}}$

$10 \times 11 = \square \rightarrow \boxed{\text{H}}$

$10 \times 2 = \square \rightarrow \boxed{\text{V}}$

$6 \times 9 = \square \rightarrow \boxed{\text{L}}$

$9 \times 9 = \square \rightarrow \boxed{\text{G}}$

$1 \times 7 = \square \rightarrow \boxed{\text{U}}$

$12 \times 8 = \square \rightarrow \boxed{\text{T}}$

$8 \times 3 = \square \rightarrow \boxed{\text{O}}$

$3 \times 5 = \square \rightarrow \boxed{\text{I}}$

$5 \times 5 = \square \rightarrow \boxed{\text{S}}$

$9 \times 12 = \square \rightarrow \boxed{\text{N}}$

$8 \times 2 = \square \rightarrow \boxed{\text{Y}}$

$12 \times 11 = \square \rightarrow \boxed{\text{A}}$

$4 \times 7 = \square \rightarrow \boxed{\text{R}}$

$2 \times 1 = \square \rightarrow \boxed{\text{D}}$

$8 \times 11 = \square \rightarrow \boxed{\text{E}}$

$10 \times 4 = \square \rightarrow \boxed{\text{F}}$

Scratch space:

CLUE 5**Division facts (1-12) - the last clue**

We must share the magnifying glasses among the junior detectives. Help us split them up evenly to get our last 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:

$144 \div 12 = \boxed{}$

$40 \div 5 = \boxed{}$

$81 \div 9 = \boxed{}$

$99 \div 9 = \boxed{}$

$12 \div 6 = \boxed{}$

$32 \div 8 = \boxed{}$

$24 \div 4 = \boxed{}$

$15 \div 5 = \boxed{}$

$90 \div 9 = \boxed{}$

$50 \div 10 = \boxed{}$

$2 \div 2 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain cut a neat glass circle, then dropped a shiny silver coin.
2. The villain took a secret photo, then left a heavy brass key.
3. The villain threw down a smoke bomb, then placed a small toy mouse.
4. The villain took a secret photo, then dropped a shiny silver coin.
5. The villain swung up the high wall, then tied a bright blue ribbon.
6. The villain shined a red laser, then placed a small toy mouse.
7. The villain took a secret photo, then placed a small toy mouse.
8. The villain shined a red laser, then dropped a shiny silver coin.
9. The villain swung up the high wall, then left a fancy feather pen.
10. The villain cut a neat glass circle, then tied a bright blue ribbon.
11. The villain swung up the high wall, then dropped a shiny silver coin.
12. The villain threw down a smoke bomb, then dropped a shiny silver coin.

Answer Key

The Case of the Missing Ruby

Culprit: Hardy

spy camera · toy mouse · left handed · gray hair · hates loud noises

Trail: Start 21 → Clue 1 18 → Clue 2 14 → Clue 3 9 → Clue 4 4 → Clue 5 1

Clue 1 (Percentages): "THE VILLAIN DOES NOT DROP A BRASS KEY"

20% of 215 = 43 (T) · 10% of 310 = 31 (K) · 25% of 48 = 12 (H) · 50% of 48 = 24 (R) · 10% of 270 = 27 (Y) · 20% of 15 = 3 (I) · 75% of 12 = 9 (E) · 25% of 156 = 39 (L) · 10% of 70 = 7 (V) · 10% of 220 = 22 (N) · 5% of 420 = 21 (B) · 50% of 40 = 20 (A) · 50% of 68 = 34 (S) · 5% of 260 = 13 (O) · 5% of 640 = 32 (D) · 25% of 148 = 37 (P)

Clue 2 (Exponents): "THE SUSPECT WRITES WITH THEIR LEFT HAND"

$10^2 = 100$ (T) · $3^5 = 243$ (P) · $3^3 = 27$ (N) · $18^2 = 324$ (D) · $3^2 = 9$ (U) · $7^3 = 343$ (C) · $2^5 = 32$ (W) · $19^2 = 361$ (L) · $6^3 = 216$ (F) · $2^7 = 128$ (A) · $14^2 = 196$ (E) · $4^3 = 64$ (H) · $13^2 = 169$ (I) · $15^2 = 225$ (R) · $5^3 = 125$ (S)

Clue 3 (Order of operations): "THE THIEF RAN AWAY FROM THE LOUD BELL"

$8 \times 9 - 5 = 67$ (T) · $8 \times 10 - 15 = 65$ (F) · $11 \times 9 - 21 = 78$ (D) · $12 + 2 \times 9 = 30$ (W) · $3 + 2 \times 4 = 11$ (E) · $1 + 2 \times 4 = 9$ (B) · $8 + 4 \times 8 = 40$ (N) · $12 \times 5 - 6 = 54$ (A) · $44 + 4 \times 9 = 80$ (O) · $6 + 2 \times 2 = 10$ (Y) · $5 \times 8 - 12 = 28$ (R) · $1 + 4 \times 7 = 29$ (U) · $6 + 7 \times 2 = 20$ (M) · $6 + 2 \times 6 = 18$ (I) · $51 + 3 \times 5 = 66$ (L) · $5 \times 4 - 5 = 15$ (H)

Clue 4 (Multiplication facts (1-12)): "WE FOUND A SILVERY GRAY HAIR ON THE WALL"

$11 \times 6 = 66$ (W) · $10 \times 11 = 110$ (H) · $10 \times 2 = 20$ (V) · $6 \times 9 = 54$ (L) · $9 \times 9 = 81$ (G) · $1 \times 7 = 7$ (U) · $12 \times 8 = 96$ (T) · $8 \times 3 = 24$ (O) · $3 \times 5 = 15$ (I) · $5 \times 5 = 25$ (S) · $9 \times 12 = 108$ (N) · $8 \times 2 = 16$ (Y) · $12 \times 11 = 132$ (A) · $4 \times 7 = 28$ (R) · $2 \times 1 = 2$ (D) · $8 \times 11 = 88$ (E) · $10 \times 4 = 40$ (F)

Clue 5 (Division facts (1-12)): surviving statement is box 7 → Hardy

$144 \div 12 = 12$ · $40 \div 5 = 8$ · $81 \div 9 = 9$ · $99 \div 9 = 11$ · $12 \div 6 = 2$ · $32 \div 8 = 4$ · $24 \div 4 = 6$ · $15 \div 5 = 3$ · $90 \div 9 = 10$ · $50 \div 10 = 5$ · $2 \div 2 = 1$