



The Case of the Midnight Ruby

Grade 5 math · Multiplication, Word problems, Multi-step word problems, Fractions of a number, Division · Reading level grades 7-9

Detective: _____ Date: _____

The priceless Midnight Ruby has been stolen from the Blackwood Manor safe during the grand masquerade. It is up to you to analyze the forensic evidence, track the clues, and point out the true thief among the high-society guests.

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 thief is _____

Possible suspects

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

NAME	SIGNATURE TOOL	ESCAPE VEHICLE	DOMINANT HAND	WIG COLOR	UNDONE BY
Nero Wolfe	skeleton key	hot air balloon	left-handed	sleek ink black	camera flash
Mycroft Holmes	pocket watch	steam-powered motorcar	left-handed	sleek ink black	scenting hounds
Sherlock Holmes	magnifying glass	steam-powered motorcar	right-handed	bright auburn	camera flash
Jane Marple	magnifying glass	rowboat on the lake	left-handed	powdered white	squeaky floorboards
John Watson	lockpick kit	underground passage	left-handed	bright auburn	camera flash
C Auguste Dupin	lockpick kit	steam-powered motorcar	left-handed	sleek ink black	squeaky floorboards
Arsene Lupin	pocket watch	stolen carriage	left-handed	sleek ink black	squeaky floorboards
Perry Mason	glass cutter	rowboat on the lake	left-handed	sleek ink black	camera flash
Sam Spade	glass cutter	stolen carriage	right-handed	powdered white	camera flash
Nancy Drew	pocket watch	underground passage	left-handed	sleek ink black	scenting hounds
Arthur Conan	pocket watch	stolen carriage	left-handed	powdered white	squeaky floorboards
Frank Hardy	skeleton key	steam-powered motorcar	left-handed	powdered white	squeaky floorboards
Father Brown	skeleton key	hot air balloon	left-handed	sleek ink black	squeaky floorboards
Irene Adler	magnifying glass	rowboat on the lake	right-handed	sleek ink black	squeaky floorboards
Ellery Queen	pocket watch	stolen carriage	left-handed	bright auburn	squeaky floorboards
James Moriarty	pocket watch	rowboat on the lake	left-handed	sleek ink black	squeaky floorboards
Charles Augustus	skeleton key	stolen carriage	right-handed	bright auburn	scenting hounds
Philip Marlowe	magnifying glass	steam-powered motorcar	right-handed	sleek ink black	camera flash
Reginald Jeeves	magnifying glass	steam-powered motorcar	left-handed	sleek ink black	squeaky floorboards
Lois Mitchell	glass cutter	stolen carriage	left-handed	bright auburn	scenting hounds
Joe Hardy	pocket watch	rowboat on the lake	right-handed	bright auburn	squeaky floorboards

CLUE 1
Multiplication facts (1-12)

To find the true list of suspects, Detective Sterling must sift through the guest ledger, counting the total guests and subtracting those who left before the heist.

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

T			T										T	
49	50	90	49	50	8	90	96	14	8	14	9	35	49	
										T				
90	2	22	108	72	90	8	9	108	2	49	35	84	90	9
22	108	48	48	8	108	32	90							

$7 \times 7 = \square \rightarrow \text{ T }$

$11 \times 2 = \square \rightarrow \text{ C }$

$2 \times 7 = \square \rightarrow \text{ D }$

$7 \times 12 = \square \rightarrow \text{ L }$

$9 \times 10 = \square \rightarrow \text{ E }$

$6 \times 12 = \square \rightarrow \text{ P }$

$5 \times 10 = \square \rightarrow \text{ H }$

$12 \times 9 = \square \rightarrow \text{ A }$

$2 \times 1 = \square \rightarrow \text{ S }$

$7 \times 5 = \square \rightarrow \text{ O }$

$3 \times 3 = \square \rightarrow \text{ N }$

$4 \times 2 = \square \rightarrow \text{ I }$

$12 \times 8 = \square \rightarrow \text{ F }$

$6 \times 8 = \square \rightarrow \text{ R }$

$8 \times 4 = \square \rightarrow \text{ G }$

Scratch space:

CLUE 2

Word problems

To verify the night guard's alibi, we must calculate the total time of his patrol route around the manor's east wing.

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

A witness saw the villain was L D D .

103 81 98 116 6 119 118 81

There were 139 footprints. 36 were used up. How many footprints are left?

Answer: → L

There were 150 magnifying glasses. 34 were used up. How many magnifying glasses are left?

Answer: → T

Detective Sterling lined up 9 rows of 9 fingerprints. How many fingerprints in all?

Answer: → E

There were 142 fingerprints. 24 were used up. How many fingerprints are left?

Answer: → N

Detective Sterling lined up 2 rows of 3 clues. How many clues in all?

Answer: → H

Detective Sterling found 109 clues yesterday and 10 more today. How many clues in all?

Answer: → A

There were 123 clues. 25 were used up. How many clues are left?

Answer: → F

Scratch space:

CLUE 3

Multi-step word problems

The butler helps by counting the rows of crystal glasses in the parlor to see how many guests gathered for the midnight toast.

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

Someone scared the villain off with

S

F
L
O
O
R
B
O

R
D
S

Detective Sterling earned 2 magnifying glasses in each of 2 rounds, plus 32 bonus magnifying glasses. Then 1 magnifying glasses were lost. How many magnifying glasses are left?

Answer: → S

There were 435 footprints in all. 22 footprints were set aside. The rest were shared equally among 7 Scotland Yard. How many footprints did each get?

Answer: → A

There were 519 footprints in all. 3 footprints were set aside. The rest were shared equally among 6 Scotland Yard. How many footprints did each get?

Answer: → U

Detective Sterling filled 5 boxes with 4 clues each, then found 60 more clues. How many clues are there in all?

Answer: → E

Detective Sterling collected 22 magnifying glasses in the morning and 65 magnifying glasses in the afternoon, then split them equally among 3 Scotland Yard. How many magnifying glasses did each get?

Answer: → Y

There were 213 footprints in all. 1 Scotland Yard used 6 footprints each. The other 3 Scotland Yard shared the rest equally. How many footprints did each of the other Scotland Yard get?

Answer: → Q

Detective Sterling collected 112 alibis in the morning and 193 alibis in the afternoon, then split them equally among 5 Scotland Yard. How many alibis did each get?

Answer: → K

Scratch space:

CLUE 4
Fractions of a number

We search the study and find a half-burned telegram on the hearth, but only a fraction of its secret message is intact.

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

A							A				A				A	
35	29	22	29	20	12	2	35	27	20	11	35	22	34	30	35	9
		A									A					
9	29	35	16	16	25	24	7	29	14	11	25	9	35	28	25	

$3/6 \text{ of } 70 = \square \rightarrow \boxed{\text{A}}$

$1/8 \text{ of } 192 = \square \rightarrow \boxed{\text{D}}$

$4/8 \text{ of } 58 = \square \rightarrow \boxed{\text{N}}$

$3/8 \text{ of } 32 = \square \rightarrow \boxed{\text{B}}$

$2/6 \text{ of } 21 = \square \rightarrow \boxed{\text{O}}$

$1/4 \text{ of } 100 = \square \rightarrow \boxed{\text{E}}$

$2/4 \text{ of } 60 = \square \rightarrow \boxed{\text{W}}$

$1/2 \text{ of } 28 = \square \rightarrow \boxed{\text{T}}$

$1/8 \text{ of } 72 = \square \rightarrow \boxed{\text{S}}$

$2/6 \text{ of } 6 = \square \rightarrow \boxed{\text{L}}$

$2/4 \text{ of } 68 = \square \rightarrow \boxed{\text{R}}$

$4/8 \text{ of } 22 = \square \rightarrow \boxed{\text{H}}$

$1/3 \text{ of } 66 = \square \rightarrow \boxed{\text{I}}$

$3/6 \text{ of } 56 = \square \rightarrow \boxed{\text{F}}$

$4/10 \text{ of } 50 = \square \rightarrow \boxed{\text{K}}$

$1/5 \text{ of } 80 = \square \rightarrow \boxed{\text{G}}$

$3/10 \text{ of } 90 = \square \rightarrow \boxed{\text{C}}$

Scratch space:

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

The investigation team splits the remaining mud splatters on the carriage paths equally to track which exit route was used.

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:

$24 \div 6 = \boxed{}$

$25 \div 5 = \boxed{}$

$7 \div 7 = \boxed{}$

$9 \div 1 = \boxed{}$

$20 \div 2 = \boxed{}$

$33 \div 3 = \boxed{}$

$7 \div 1 = \boxed{}$

$12 \div 6 = \boxed{}$

$72 \div 6 = \boxed{}$

$24 \div 8 = \boxed{}$

$30 \div 5 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain unlocked the heavy vault using a skeleton key, then drifted over the estate in a hot air balloon.
2. The villain unlocked the heavy vault using a skeleton key, then fled into the night in a stolen carriage.
3. The villain cracked the combination lock with a magnifying glass, then fled into the night in a stolen carriage.
4. The villain slipped past the guards with a lockpick kit, then sped away in a steam-powered motorcar.
5. The villain cracked the combination lock with a magnifying glass, then sped away in a steam-powered motorcar.
6. The villain slipped past the guards with a lockpick kit, then rowed across the dark lake in a rowboat.
7. The villain slipped past the guards with a lockpick kit, then escaped through an underground passage.
8. The villain timed the security patrols using a pocket watch, then rowed across the dark lake in a rowboat.
9. The villain quietly sliced the display case with a glass cutter, then rowed across the dark lake in a rowboat.
10. The villain slipped past the guards with a lockpick kit, then fled into the night in a stolen carriage.
11. The villain unlocked the heavy vault using a skeleton key, then sped away in a steam-powered motorcar.
12. The villain quietly sliced the display case with a glass cutter, then escaped through an underground passage.

Answer Key

The Case of the Midnight Ruby

Culprit: James Moriarty

pocket watch · rowboat on the lake · left-handed · sleek ink black · squeaky floorboards

Trail: Start 21 → Clue 1 15 → Clue 2 11 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Multiplication facts (1-12)): "THE THIEF DID NOT ESCAPE IN A STOLEN CARRIAGE"

$7 \times 7 = 49$ (T) · $11 \times 2 = 22$ (C) · $2 \times 7 = 14$ (D) · $7 \times 12 = 84$ (L) · $9 \times 10 = 90$ (E) · $6 \times 12 = 72$ (P) · $5 \times 10 = 50$ (H) · $12 \times 9 = 108$ (A) · $2 \times 1 = 2$ (S) · $7 \times 5 = 35$ (O) · $3 \times 3 = 9$ (N) · $4 \times 2 = 8$ (I) · $12 \times 8 = 96$ (F) · $6 \times 8 = 48$ (R) · $8 \times 4 = 32$ (G)

Clue 2 (Word problems): "LEFT HANDED"

There were 139 footprints. 36 were used up. How many footprints are left? = 103 (L) · There were 150 magnifying glasses. 34 were used up. How many magnifying glasses are left? = 116 (T) · Detective Sterling lined up 9 rows of 9 fingerprints. How many fingerprints in all? = 81 (E) · There were 142 fingerprints. 24 were used up. How many fingerprints are left? = 118 (N) · Detective Sterling lined up 2 rows of 3 clues. How many clues in all? = 6 (H) · Detective Sterling found 109 clues yesterday and 10 more today. How many clues in all? = 119 (A) · There were 123 clues. 25 were used up. How many clues are left? = 98 (F)

Clue 3 (Multi-step word problems): "SQUEAKY FLOORBOARDS"

Detective Sterling earned 2 magnifying glasses in each of 2 rounds, plus 32 bonus magnifying glasses. Then 1 magnifying glasses were lost. How many magnifying glasses are left? = 35 (S) · There were 435 footprints in all. 22 footprints were set aside. The rest were shared equally among 7 Scotland Yard. How many footprints did each get? = 59 (A) · There were 519 footprints in all. 3 footprints were set aside. The rest were shared equally among 6 Scotland Yard. How many footprints did each get? = 86 (U) · Detective Sterling filled 5 boxes with 4 clues each, then found 60 more clues. How many clues are there in all? = 80 (E) · Detective Sterling collected 22 magnifying glasses in the morning and 65 magnifying glasses in the afternoon, then split them equally among 3 Scotland Yard. How many magnifying glasses did each get? = 29 (Y) · There were 213 footprints in all. 1 Scotland Yard used 6 footprints each. The other 3 Scotland Yard shared the rest equally. How many footprints did each of the other Scotland Yard get? = 69 (Q) · Detective Sterling collected 112 alibis in the morning and 193 alibis in the afternoon, then split them equally among 5 Scotland Yard. How many alibis did each get? = 61 (K)

Clue 4 (Fractions of a number): "AN INK BLACK HAIR WAS SNAGGED ON THE SAFE"

$\frac{3}{6}$ of 70 = 35 (A) · $\frac{1}{8}$ of 192 = 24 (D) · $\frac{4}{8}$ of 58 = 29 (N) · $\frac{3}{8}$ of 32 = 12 (B) · $\frac{2}{6}$ of 21 = 7 (O) · $\frac{1}{4}$ of 100 = 25 (E) · $\frac{2}{4}$ of 60 = 30 (W) · $\frac{1}{2}$ of 28 = 14 (T) · $\frac{1}{8}$ of 72 = 9 (S) · $\frac{2}{6}$ of 6 = 2 (L) · $\frac{2}{4}$ of 68 = 34 (R) · $\frac{4}{8}$ of 22 = 11 (H) · $\frac{1}{3}$ of 66 = 22 (I) · $\frac{3}{6}$ of 56 = 28 (F) · $\frac{4}{10}$ of 50 = 20 (K) · $\frac{1}{5}$ of 80 = 16 (G) · $\frac{3}{10}$ of 90 = 27 (C)

Clue 5 (Division facts (1-12)): surviving statement is box 8 → James Moriarty

$24 \div 6 = 4$ · $25 \div 5 = 5$ · $7 \div 7 = 1$ · $9 \div 1 = 9$ · $20 \div 2 = 10$ · $33 \div 3 = 11$ · $7 \div 1 = 7$ · $12 \div 6 = 2$ · $72 \div 6 = 12$ · $24 \div 8 = 3$ · $30 \div 5 = 6$