



The Mystery of the Autumn Manor Library

Grade 5 math · Fractions of a number, Word problems, Order of operations, Multiplication · Reading level grades 5-6

Detective: _____ **Date:** _____

During the annual Autumn Harvest Festival, a rare manuscript vanished from the drafty study of Maplewood Manor. Crisp fallen leaves blow through the open window, and mysterious tea stains mark the scene. As the lead detective, you must unravel the clues hidden in the library archives before the thief slips away into the foggy autumn night.

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 Shadow Archivist is _____

Possible suspects

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

NAME	ARTIFACT	KEEPSAKE	WRITING HAND	HAIR COLOR	WEAKNESS
H G Wells	Magic Bookmark	Maple Leaf Charm	Right-Handed Writer	Raven Black	Fresh Apple Cider
Edgar Poe	Reader Glass	Golden Acorn	Right-Handed Writer	Amber Red	Fresh Apple Cider
Lewis Carroll	Reader Glass	Pumpkin Lantern	Left-Handed Writer	Chestnut Brown	Fresh Apple Cider
Hans Andersen	Reader Glass	Pumpkin Lantern	Left-Handed Writer	Raven Black	Bright Reading Lamp
Jules Verne	Shadow Page	Pumpkin Lantern	Right-Handed Writer	Raven Black	Bright Reading Lamp
Astrid Lindgren	Glowing Quill	Maple Leaf Charm	Right-Handed Writer	Chestnut Brown	Fresh Apple Cider
Arthur Doyle	Shadow Page	Pumpkin Lantern	Left-Handed Writer	Raven Black	Bright Reading Lamp
Beatrix Potter	Glowing Quill	Maple Leaf Charm	Left-Handed Writer	Raven Black	Dust Mite Spray
Louisa Alcott	Shadow Page	Maple Leaf Charm	Right-Handed Writer	Amber Red	Dust Mite Spray
Frank Baum	Reader Glass	Cinnamon Scroll	Left-Handed Writer	Chestnut Brown	Bright Reading Lamp
Joe Hardy	Enchanted Ink	Maple Leaf Charm	Left-Handed Writer	Raven Black	Bright Reading Lamp
Frank Hardy	Shadow Page	Golden Acorn	Left-Handed Writer	Raven Black	Dust Mite Spray
Oscar Wilde	Reader Glass	Spice Tea Thermos	Right-Handed Writer	Amber Red	Dust Mite Spray
Agatha Christie	Magic Bookmark	Cinnamon Scroll	Left-Handed Writer	Raven Black	Bright Reading Lamp
Charles Dickens	Enchanted Ink	Maple Leaf Charm	Left-Handed Writer	Chestnut Brown	Bright Reading Lamp
Judy Blume	Reader Glass	Pumpkin Lantern	Left-Handed Writer	Amber Red	Fresh Apple Cider
Maurice Sendak	Reader Glass	Pumpkin Lantern	Right-Handed Writer	Amber Red	Fresh Apple Cider
Bram Stoker	Shadow Page	Spice Tea Thermos	Right-Handed Writer	Chestnut Brown	Fresh Apple Cider
Nancy Drew	Glowing Quill	Spice Tea Thermos	Left-Handed Writer	Raven Black	Bright Reading Lamp
Enid Blyton	Magic Bookmark	Pumpkin Lantern	Right-Handed Writer	Raven Black	Bright Reading Lamp
Emily Bronte	Magic Bookmark	Spice Tea Thermos	Left-Handed Writer	Raven Black	Fresh Apple Cider

Fractions of a number

You examine the library logbook where the missing manuscript numbers are described in short store records.

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

Three rows of number boxes for a multiplication problem. The boxes are arranged in a grid-like pattern with some boxes highlighted in orange.

Row 1: 19, 17, 4, 8, 32, 30, 30, 11, 32, 29, 24, 28, 4, 10, 29, 28, 19

Row 2: 20, 11, 6, 6, 39, 11, 10, 25, 32, 20, 4, 19, 4, 11

Row 3: 19, 17, 4, 6, 9, 28, 10

$$\frac{1}{8} \text{ of } 152 = \boxed{} \rightarrow \boxed{\text{T}}$$

$4/8$ of $56 = \boxed{} \rightarrow \boxed{0}$

$$\frac{1}{5} \text{ of } 45 = \boxed{} \rightarrow \boxed{\text{M}}$$

$$\frac{2}{5} \text{ of } 25 = \boxed{} \rightarrow \boxed{\text{S}}$$

$4/8$ of $48 = \boxed{} \rightarrow \boxed{\text{D}}$

$$2/6 \text{ of } 51 = \boxed{} \rightarrow \boxed{\text{H}}$$

$2/8$ of $44 = \boxed{} \rightarrow \mathbf{A}$

$2/3$ of 9 = $\rightarrow$ **R**

2/10 of 145 = → **N**

$$2/10 \text{ of } 125 = \boxed{} \rightarrow \boxed{\text{P}}$$

$$1/2 \text{ of } 64 = \boxed{} \rightarrow \boxed{\text{I}}$$

$\frac{1}{8}$ of 160 = $\rightarrow$ **C**

$\frac{3}{4}$ of 40 = $\rightarrow$ **L**

3/6 of 78 = → **Y**

$1/5 \text{ of } 40 = \boxed{} \rightarrow \boxed{\mathbf{v}}$

$8/10$ of $5 = \boxed{} \rightarrow \boxed{\text{E}}$

Scratch space:

CLUE 2

Word problems

A torn catalog sheet lists fractions of the archive stack inventory that remain undisturbed.

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	W	R	I			R
71	93	105	40	28	36	37		93						40	93	

There were 102 leather books. 31 were used up. How many leather books are left?

Answer: → **L**

Archivist found 10 magnifying glasses yesterday and 18 more today. How many magnifying glasses in all?

Answer: → **H**

Archivist lined up 4 rows of 10 magnifying glasses. How many magnifying glasses in all?

Answer: → **T**

Archivist found 20 pumpkin bookmarks yesterday and 16 more today. How many pumpkin bookmarks in all?

Answer: → **A**

Archivist found 88 feather quills yesterday and 17 more today. How many feather quills in all?

Answer: → **F**

Archivist found 28 autumn leaves yesterday and 9 more today. How many autumn leaves in all?

Answer: → **N**

There were 116 feather quills. 23 were used up. How many feather quills are left?

Answer: → **E**

Scratch space:

CLUE 3

Order of operations

To unlock the wooden cabinet behind the chimney, you must solve a order of operations sequence on a brass lock.

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

T				T	T										
74	71	20	39	74	74	39	28	11	20	34	63	39	62		
														T	
15	49	44	23	13	20	13	15	37	39	15	34	44	78	71	74
34	20	39	13	44	23	78	49	39	21	32					

$7 \times 11 - 3 = \square \rightarrow \boxed{\text{T}}$

$6 \times 12 - 23 = \square \rightarrow \boxed{\text{L}}$

$11 + 6 \times 2 = \square \rightarrow \boxed{\text{N}}$

$50 + 3 \times 4 = \square \rightarrow \boxed{\text{S}}$

$7 \times 6 - 3 = \square \rightarrow \boxed{\text{A}}$

$5 + 2 \times 3 = \square \rightarrow \boxed{\text{K}}$

$20 + 3 \times 4 = \square \rightarrow \boxed{\text{P}}$

$11 \times 2 - 1 = \square \rightarrow \boxed{\text{M}}$

$29 + 6 \times 7 = \square \rightarrow \boxed{\text{H}}$

$20 + 4 \times 2 = \square \rightarrow \boxed{\text{C}}$

$8 \times 7 - 12 = \square \rightarrow \boxed{\text{I}}$

$5 \times 8 - 25 = \square \rightarrow \boxed{\text{B}}$

$3 + 5 \times 2 = \square \rightarrow \boxed{\text{D}}$

$11 \times 6 - 3 = \square \rightarrow \boxed{\text{W}}$

$4 \times 11 - 10 = \square \rightarrow \boxed{\text{R}}$

$9 \times 9 - 3 = \square \rightarrow \boxed{\text{G}}$

$7 \times 4 - 8 = \square \rightarrow \boxed{\text{E}}$

$6 \times 11 - 29 = \square \rightarrow \boxed{\text{Y}}$

Scratch space:

CLUE 4
Multiplication facts (1-12)

The suspect arranged stolen book crates into identical rows across the autumn reading lawn.

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

A								A						A		
88	22	63	3	24	110	40	33	88	20	40	3	6	110	88	100	72

	A				A				A							A
84	88	63	33	4	88	22	121	33	88	70	70	40	36	63	3	88

	A		
70	88	24	40

$8 \times 11 = \square \rightarrow \text{A}$	$10 \times 10 = \square \rightarrow \text{C}$	$9 \times 7 = \square \rightarrow \text{I}$
$11 \times 3 = \square \rightarrow \text{R}$	$7 \times 10 = \square \rightarrow \text{P}$	$11 \times 11 = \square \rightarrow \text{T}$
$11 \times 2 = \square \rightarrow \text{S}$	$3 \times 1 = \square \rightarrow \text{N}$	$11 \times 10 = \square \rightarrow \text{L}$
$6 \times 12 = \square \rightarrow \text{K}$	$7 \times 12 = \square \rightarrow \text{H}$	$10 \times 4 = \square \rightarrow \text{E}$
$6 \times 1 = \square \rightarrow \text{B}$	$6 \times 4 = \square \rightarrow \text{G}$	$10 \times 2 = \square \rightarrow \text{V}$
$12 \times 3 = \square \rightarrow \text{D}$	$2 \times 2 = \square \rightarrow \text{W}$	

Scratch space:

CLUE 5**Fractions of a number - the last clue**

Calculating the leftover pumpkin ink supplies requires determining exact fractions of the original batch.

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:

$2/6 \text{ of } 6 = \boxed{}$

$1/6 \text{ of } 6 = \boxed{}$

$2/6 \text{ of } 36 = \boxed{}$

$1/4 \text{ of } 24 = \boxed{}$

$2/8 \text{ of } 28 = \boxed{}$

$1/3 \text{ of } 33 = \boxed{}$

$4/6 \text{ of } 15 = \boxed{}$

$4/6 \text{ of } 12 = \boxed{}$

$4/8 \text{ of } 10 = \boxed{}$

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

$1/5 \text{ of } 15 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain scrambles the archive shelves, then leaves a trail of pumpkin seeds.
2. The villain hides the golden bookmark, then scatters crisp maple leaves.
3. The villain hides the golden bookmark, then drops an empty spice tea thermos.
4. The villain swipes the rare manuscript, then unrolls a dusty cinnamon scroll.
5. The villain enchants the card catalog, then leaves a trail of pumpkin seeds.
6. The villain scrambles the archive shelves, then buries a golden acorn in a desk.
7. The villain swipes the rare manuscript, then leaves a trail of pumpkin seeds.
8. The villain traps the catalog in shadows, then unrolls a dusty cinnamon scroll.
9. The villain enchants the card catalog, then buries a golden acorn in a desk.
10. The villain swipes the rare manuscript, then buries a golden acorn in a desk.
11. The villain swipes the rare manuscript, then scatters crisp maple leaves.
12. The villain traps the catalog in shadows, then leaves a trail of pumpkin seeds.

Answer Key

The Mystery of the Autumn Manor Library

Culprit: Agatha Christie

Magic Bookmark · Cinnamon Scroll · Left-Handed Writer · Raven Black · Bright Reading Lamp

Trail: Start 21 → Clue 1 17 → Clue 2 10 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE VILLAIN DOES NOT CARRY A SPICE TEA THERMOS"

$\frac{1}{8}$ of 152 = 19 (T) · $\frac{4}{8}$ of 56 = 28 (O) · $\frac{1}{5}$ of 45 = 9 (M) · $\frac{2}{5}$ of 25 = 10 (S) · $\frac{4}{8}$ of 48 = 24 (D) · $\frac{2}{6}$ of 51 = 17 (H) · $\frac{2}{8}$ of 44 = 11 (A) · $\frac{2}{3}$ of 9 = 6 (R) · $\frac{2}{10}$ of 145 = 29 (N) · $\frac{2}{10}$ of 125 = 25 (P) · $\frac{1}{2}$ of 64 = 32 (I) · $\frac{1}{8}$ of 160 = 20 (C) · $\frac{3}{4}$ of 40 = 30 (L) · $\frac{3}{6}$ of 78 = 39 (Y) · $\frac{1}{5}$ of 40 = 8 (V) · $\frac{8}{10}$ of 5 = 4 (E)

Clue 2 (Word problems): "LEFT HANDED WRITER"

There were 102 leather books. 31 were used up. How many leather books are left? = 71 (L) · Archivist found 10 magnifying glasses yesterday and 18 more today. How many magnifying glasses in all? = 28 (H) · Archivist lined up 4 rows of 10 magnifying glasses. How many magnifying glasses in all? = 40 (T) · Archivist found 20 pumpkin bookmarks yesterday and 16 more today. How many pumpkin bookmarks in all? = 36 (A) · Archivist found 88 feather quills yesterday and 17 more today. How many feather quills in all? = 105 (F) · Archivist found 28 autumn leaves yesterday and 9 more today. How many autumn leaves in all? = 37 (N) · There were 116 feather quills. 23 were used up. How many feather quills are left? = 93 (E)

Clue 3 (Order of operations): "THE ATTACKER WAS BLINDED BY A BRIGHT READING LAMP"

$7 \times 11 - 3 = 74$ (T) · $6 \times 12 - 23 = 49$ (L) · $11 + 6 \times 2 = 23$ (N) · $50 + 3 \times 4 = 62$ (S) · $7 \times 6 - 3 = 39$ (A) · $5 + 2 \times 3 = 11$ (K) · $20 + 3 \times 4 = 32$ (P) · $11 \times 2 - 1 = 21$ (M) · $29 + 6 \times 7 = 71$ (H) · $20 + 4 \times 2 = 28$ (C) · $8 \times 7 - 12 = 44$ (I) · $5 \times 8 - 25 = 15$ (B) · $3 + 5 \times 2 = 13$ (D) · $11 \times 6 - 3 = 63$ (W) · $4 \times 11 - 10 = 34$ (R) · $9 \times 9 - 3 = 78$ (G) · $7 \times 4 - 8 = 20$ (E) · $6 \times 11 - 29 = 37$ (Y)

Clue 4 (Multiplication facts (1-12)): "A SINGLE RAVEN BLACK HAIR WAS TRAPPED IN A PAGE"

$8 \times 11 = 88$ (A) · $10 \times 10 = 100$ (C) · $9 \times 7 = 63$ (I) · $11 \times 3 = 33$ (R) · $7 \times 10 = 70$ (P) · $11 \times 11 = 121$ (T) · $11 \times 2 = 22$ (S) · $3 \times 1 = 3$ (N) · $11 \times 10 = 110$ (L) · $6 \times 12 = 72$ (K) · $7 \times 12 = 84$ (H) · $10 \times 4 = 40$ (E) · $6 \times 1 = 6$ (B) · $6 \times 4 = 24$ (G) · $10 \times 2 = 20$ (V) · $12 \times 3 = 36$ (D) · $2 \times 2 = 4$ (W)

Clue 5 (Fractions of a number): surviving statement is box 4 → Agatha Christie

$\frac{2}{6}$ of 6 = 2 · $\frac{1}{6}$ of 6 = 1 · $\frac{2}{6}$ of 36 = 12 · $\frac{1}{4}$ of 24 = 6 · $\frac{2}{8}$ of 28 = 7 · $\frac{1}{3}$ of 33 = 11 · $\frac{4}{6}$ of 15 = 10 · $\frac{4}{6}$ of 12 = 8 · $\frac{4}{8}$ of 10 = 5 · $\frac{1}{8}$ of 72 = 9 · $\frac{1}{5}$ of 15 = 3