



The Pumpkin Patch Phantom

Grade 8 math · Exponents, Square roots, Pythagorean theorem, Order of operations, Two-step equations · Reading level grades 7-9

Detective: _____ Date: _____

Someone smashed the prize pumpkin right before midnight! Solve the math clues to identify the culprit before the weigh-in ends.

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 Ghoulsh Prankster is _____

Possible suspects

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

NAME	MAIN POWER	EXTRA POWER	TELL	HAIR	WEAKNESS
Gomez Addams	Pumpkin Launcher	Echo Screech	Right Handed	Purple Spikes	Salt Spray
Vincent Price	Shadow Blaster	Ghost Step	Right Handed	Purple Spikes	Bright Flash
Morticia Addams	Bat Swarm	Ghost Step	Right Handed	Black Hood	Bright Flash
Grandpa Munster	Pumpkin Launcher	Web Spinner	Left Handed	Black Hood	Garlic Mist
Bela Lugosi	Shadow Blaster	Echo Screech	Right Handed	Purple Spikes	Garlic Mist
Wednesday Addams	Pumpkin Launcher	Glider Wings	Right Handed	Black Hood	Garlic Mist
Laurie Strode	Shadow Blaster	Glow Aura	Right Handed	Black Hood	Garlic Mist
Jack O Lantern	Bat Swarm	Glider Wings	Right Handed	Orange Wig	Salt Spray
Eddie Munster	Fog Weaver	Web Spinner	Right Handed	Black Hood	Bright Flash
Casper Ghost	Shadow Blaster	Glider Wings	Right Handed	Black Hood	Bright Flash
Ichabod Crane	Fog Weaver	Ghost Step	Right Handed	Black Hood	Garlic Mist
Winifred Sanderson	Candy Thief	Echo Screech	Right Handed	Purple Spikes	Salt Spray
Igor Stitch	Candy Thief	Ghost Step	Right Handed	Orange Wig	Bright Flash
Pugsley Addams	Fog Weaver	Glider Wings	Right Handed	Purple Spikes	Bright Flash
Victor Frankenstein	Pumpkin Launcher	Echo Screech	Right Handed	Black Hood	Garlic Mist
Elvira Dark	Fog Weaver	Ghost Step	Right Handed	Purple Spikes	Salt Spray
Uncle Fester	Bat Swarm	Glider Wings	Right Handed	Black Hood	Garlic Mist
Sarah Sanderson	Candy Thief	Glow Aura	Right Handed	Black Hood	Bright Flash
Sabrina Spellman	Bat Swarm	Glider Wings	Left Handed	Black Hood	Garlic Mist
Boris Karloff	Candy Thief	Glow Aura	Left Handed	Orange Wig	Bright Flash
Salem Spellman	Shadow Blaster	Ghost Step	Right Handed	Black Hood	Garlic Mist

CLUE 1 Exponents

To calculate power growth in the spell book decode the exponential rating on the ancient cauldron.

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

T																		
64	256	196	324	144	196	4	400	729	49	196	324	144	49	64	32	324	196	

243	256	49	324	64	324	64	196	225

$4^3 = \square \rightarrow \text{T}$	$3^5 = \square \rightarrow \text{G}$	$2^5 = \square \rightarrow \text{U}$	$14^2 = \square \rightarrow \text{E}$
$12^2 = \square \rightarrow \text{N}$	$3^6 = \square \rightarrow \text{D}$	$2^8 = \square \rightarrow \text{H}$	$18^2 = \square \rightarrow \text{S}$
$15^2 = \square \rightarrow \text{P}$	$7^2 = \square \rightarrow \text{O}$	$2^2 = \square \rightarrow \text{A}$	$20^2 = \square \rightarrow \text{K}$

Scratch space:

CLUE 2 Square roots

The security grid area is square so finding its side length requires evaluating the square root.

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

W									W								
12	18	21	9	13	11	11	11	24	12	21	23	13	3	5	11	13	
16	18	15	23	21	23	24	9	25									

$$\sqrt{144} = \square \rightarrow \boxed{W}$$

$$\sqrt{324} = \square \rightarrow \boxed{I}$$

$$\sqrt{256} = \square \rightarrow \boxed{R}$$

$$\sqrt{529} = \square \rightarrow \boxed{H}$$

$$\sqrt{441} = \square \rightarrow \boxed{T}$$

$$\sqrt{625} = \square \rightarrow \boxed{D}$$

$$\sqrt{9} = \square \rightarrow \boxed{M}$$

$$\sqrt{225} = \square \rightarrow \boxed{G}$$

$$\sqrt{121} = \square \rightarrow \boxed{S}$$

$$\sqrt{576} = \square \rightarrow \boxed{A}$$

$$\sqrt{81} = \square \rightarrow \boxed{N}$$

$$\sqrt{169} = \square \rightarrow \boxed{E}$$

$$\sqrt{25} = \square \rightarrow \boxed{U}$$

Scratch space:

CLUE 3

Pythagorean theorem

To measure the diagonal path taken across the pumpkin field calculate the hypotenuse.

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

G																			
74	75	26	10	34	51	5	34	68	39	51	29	75	68	20	15	39	29	20	5

40	52	52

legs 24 and 70, hypotenuse = → **G**

legs 20 and 21, hypotenuse = → **H**

legs 9 and 12, hypotenuse = → **D**

legs 6 and 8, hypotenuse = → **L**

legs 32 and 60, hypotenuse = → **S**

legs 21 and 72, hypotenuse = → **A**

legs 20 and 48, hypotenuse = → **F**

legs 10 and 24, hypotenuse = → **R**

legs 15 and 36, hypotenuse = → **T**

legs 12 and 16, hypotenuse = → **E**

legs 3 and 4, hypotenuse = → **M**

legs 16 and 30, hypotenuse = → **I**

legs 24 and 45, hypotenuse = → **C**

legs 24 and 32, hypotenuse = → **O**

Scratch space:

CLUE 4

Order of operations

The automated lock keypad requires evaluating the operational priority of the code steps.

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

B												B			
92	53	99	44	100	110	91	91	39	82	99	92	46	61	44	
43	112	46	99	84	39	43	46	14	8	99	61	84	14	39	

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

$12 \times 6 - 26 = \square \rightarrow \text{R}$

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

$1 + 6 \times 7 = \square \rightarrow \text{S}$

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

$79 + 7 \times 3 = \square \rightarrow \text{K}$

$12 \times 9 - 26 = \square \rightarrow \text{F}$

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

$7 \times 10 - 17 = \square \rightarrow \text{L}$

$11 \times 11 - 11 = \square \rightarrow \text{H}$

$71 + 5 \times 4 = \square \rightarrow \text{O}$

$91 + 3 \times 7 = \square \rightarrow \text{T}$

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

$10 \times 6 - 21 = \square \rightarrow \text{D}$

$10 \times 9 - 29 = \square \rightarrow \text{I}$

$11 \times 10 - 26 = \square \rightarrow \text{N}$

Scratch space:

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

To balance the scale at the weighing station solve the two step equation for the missing weight.

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:

$5x + 1 = 51, x = \boxed{}$

$3x + 1 = 13, x = \boxed{}$

$2x + 1 = 23, x = \boxed{}$

$2x + 10 = 26, x = \boxed{}$

$2x + 10 = 28, x = \boxed{}$

$2x + 1 = 13, x = \boxed{}$

$2x + 3 = 9, x = \boxed{}$

$3x + 2 = 38, x = \boxed{}$

$4x + 6 = 10, x = \boxed{}$

$2x + 10 = 24, x = \boxed{}$

$2x + 11 = 15, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain launched a heavy pumpkin, then used ghost step.
2. The villain wove a thick fog, then used ghost step.
3. The villain snatched the candy bag, then spun a sticky web.
4. The villain launched a heavy pumpkin, then deployed glider wings.
5. The villain fired a shadow blast, then activated a glow aura.
6. The villain summoned a bat swarm, then spun a sticky web.
7. The villain summoned a bat swarm, then unleashed an echo screech.
8. The villain summoned a bat swarm, then used ghost step.
9. The villain summoned a bat swarm, then activated a glow aura.
10. The villain summoned a bat swarm, then deployed glider wings.
11. The villain launched a heavy pumpkin, then unleashed an echo screech.
12. The villain wove a thick fog, then deployed glider wings.

Answer Key

The Pumpkin Patch Phantom

Culprit: Laurie Strode

Shadow Blaster · Glow Aura · Right Handed · Black Hood · Garlic Mist

Trail: Start 21 → Clue 1 15 → Clue 2 12 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Exponents): "THE SNEAK DOES NOT USE GHOST STEP"

$4^3 = 64$ (T) · $3^5 = 243$ (G) · $2^5 = 32$ (U) · $14^2 = 196$ (E) · $12^2 = 144$ (N) · $3^6 = 729$ (D) · $2^8 = 256$ (H) · $18^2 = 324$ (S) · $15^2 = 225$ (P) · $7^2 = 49$ (O) · $2^2 = 4$ (A) · $20^2 = 400$ (K)

Clue 2 (Square roots): "WITNESS SAW THEM USE RIGHT HAND"

$\sqrt{144} = 12$ (W) · $\sqrt{324} = 18$ (I) · $\sqrt{256} = 16$ (R) · $\sqrt{529} = 23$ (H) · $\sqrt{441} = 21$ (T) · $\sqrt{625} = 25$ (D) · $\sqrt{9} = 3$ (M) · $\sqrt{225} = 15$ (G) · $\sqrt{121} = 11$ (S) · $\sqrt{576} = 24$ (A) · $\sqrt{81} = 9$ (N) · $\sqrt{169} = 13$ (E) · $\sqrt{25} = 5$ (U)

Clue 3 (Pythagorean theorem): "GARLIC MIST CHASED THEM OFF"

legs 24 and 70, hypotenuse = 74 (G) · legs 20 and 21, hypotenuse = 29 (H) · legs 9 and 12, hypotenuse = 15 (D) · legs 6 and 8, hypotenuse = 10 (L) · legs 32 and 60, hypotenuse = 68 (S) · legs 21 and 72, hypotenuse = 75 (A) · legs 20 and 48, hypotenuse = 52 (F) · legs 10 and 24, hypotenuse = 26 (R) · legs 15 and 36, hypotenuse = 39 (T) · legs 12 and 16, hypotenuse = 20 (E) · legs 3 and 4, hypotenuse = 5 (M) · legs 16 and 30, hypotenuse = 34 (I) · legs 24 and 45, hypotenuse = 51 (C) · legs 24 and 32, hypotenuse = 40 (O)

Clue 4 (Order of operations): "BLACK HOOD FABRIC STRANDS REMAINED"

$10 \times 10 - 8 = 92$ (B) · $12 \times 6 - 26 = 46$ (R) · $8 \times 7 - 12 = 44$ (C) · $1 + 6 \times 7 = 43$ (S) · $12 \times 9 - 9 = 99$ (A) · $79 + 7 \times 3 = 100$ (K) · $12 \times 9 - 26 = 82$ (F) · $2 + 6 \times 2 = 14$ (E) · $7 \times 10 - 17 = 53$ (L) · $11 \times 11 - 11 = 110$ (H) · $71 + 5 \times 4 = 91$ (O) · $91 + 3 \times 7 = 112$ (T) · $4 + 2 \times 2 = 8$ (M) · $10 \times 6 - 21 = 39$ (D) · $10 \times 9 - 29 = 61$ (I) · $11 \times 10 - 26 = 84$ (N)

Clue 5 (Two-step equations): surviving statement is box 5 → Laurie Strode

$5x + 1 = 51, x = 10$ · $3x + 1 = 13, x = 4$ · $2x + 1 = 23, x = 11$ · $2x + 10 = 26, x = 8$ · $2x + 10 = 28, x = 9$ · $2x + 1 = 13, x = 6$ · $2x + 3 = 9, x = 3$ · $3x + 2 = 38, x = 12$ · $4x + 6 = 10, x = 1$ · $2x + 10 = 24, x = 7$ · $2x + 11 = 15, x = 2$