



The Sky-Island Compass Caper

Grade 7 math · Integers, Percentages, Order of operations, Exponents, Two-step equations · Reading level grades 7-9

Detective: _____ **Date:** _____

The legendary Golden Compass has been stolen from the Grand Archives of Aethelgard! The perpetrator, a notorious Sky Bandit, escaped via glider into the swirling cloud banks. It is up to you, the youngest recruit of the Royal Rangers, to track down the culprit before they unlock the hidden treasures of the Ancients.

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 Sky Bandit is _____

Possible suspects

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

NAME	SIGNATURE GEAR	ESCAPE DEVICE	DOMINANT HAND	GOGGLE STRAP COLOR	FEAR
Gagarin Glide	Climbing Claws	Zip Line	Right-handed	Sunset Orange	Loud Noises
Shackleton Gale	Glider Wings	Jetpack	Left-handed	Neon Blue	High Winds
Nansen North	Smoke Bomb	Parachute	Left-handed	Neon Blue	Bright Lights
Collins Comet	Glider Wings	Parachute	Left-handed	Neon Blue	Bright Lights
Cook Cabin	Smoke Bomb	Teleporter	Left-handed	Sunset Orange	Bright Lights
Hudson Helm	Jet Boots	Zip Line	Right-handed	Neon Blue	Loud Noises
Zheng Hoist	Glider Wings	Zip Line	Left-handed	Sunset Orange	High Winds
Orville Cloud	Jet Boots	Zip Line	Right-handed	Neon Blue	Bright Lights
Marco Map	Grappling Hook	Balloon Belt	Right-handed	Neon Blue	Bright Lights
Franklin Frost	Jet Boots	Jetpack	Left-handed	Neon Blue	High Winds
Polo Peak	Jet Boots	Teleporter	Right-handed	Neon Blue	Bright Lights
Cabot Compass	Grappling Hook	Teleporter	Right-handed	Acid Green	Bright Lights
Ride Rocket	Climbing Claws	Zip Line	Left-handed	Sunset Orange	High Winds
Freya Flight	Grappling Hook	Teleporter	Left-handed	Neon Blue	High Winds
Cousteau Cape	Smoke Bomb	Parachute	Right-handed	Sunset Orange	Bright Lights
Vespucci Vale	Smoke Bomb	Parachute	Left-handed	Acid Green	Bright Lights
Amelia Sky	Smoke Bomb	Zip Line	Left-handed	Acid Green	Bright Lights
Wilbur Wind	Grappling Hook	Balloon Belt	Left-handed	Sunset Orange	High Winds
Earhart Air	Climbing Claws	Parachute	Right-handed	Neon Blue	Bright Lights
Lindbergh Lift	Smoke Bomb	Teleporter	Right-handed	Neon Blue	Bright Lights
Captain Drake	Jet Boots	Balloon Belt	Right-handed	Neon Blue	High Winds

CLUE 1 Integers

To calculate the escape vector, you analyze the altimeter data from the archive tower. Track these positive and negative integer changes to find the suspect's flight path and rule out one escape device.

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

T									T									T
13	23	11	14	5	20	6	4	13	6	30	11	21	20	30	13			
								T										
11	21	16	5	22	11	24	4	13	23	5	9	4	22	25	4	20	11	

$9 - (-4) = \square \rightarrow \text{T}$	$29 - (-1) = \square \rightarrow \text{O}$	$(-14) + 18 = \square \rightarrow \text{I}$
$(-14) + 39 = \square \rightarrow \text{L}$	$11 - (-11) = \square \rightarrow \text{P}$	$13 - (-10) = \square \rightarrow \text{H}$
$7 - (-2) = \square \rightarrow \text{Z}$	$11 - (-10) = \square \rightarrow \text{S}$	$(-14) + 19 = \square \rightarrow \text{A}$
$(-8) + 24 = \square \rightarrow \text{C}$	$(-6) + 12 = \square \rightarrow \text{D}$	$3 - (-8) = \square \rightarrow \text{E}$
$23 - (-1) = \square \rightarrow \text{W}$	$9 - (-11) = \square \rightarrow \text{N}$	$(-11) + 25 = \square \rightarrow \text{B}$

Scratch space:

CLUE 2 Percentages

The energy grid at the docks was partially drained during the getaway. Calculate the remaining percentages on the power cells to reveal a clue about the bandit's dominant hand.

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

T																			
50	30	41	27	36	39	29	20	20	17	29	40	24	27	4	41	39	41		
35	57	8	41	20	14	57	39	29	24	30	50	14							

$10\% \text{ of } 500 = \square \rightarrow \boxed{\text{T}}$

$25\% \text{ of } 156 = \square \rightarrow \boxed{\text{R}}$

$10\% \text{ of } 350 = \square \rightarrow \boxed{\text{M}}$

$20\% \text{ of } 200 = \square \rightarrow \boxed{\text{N}}$

$20\% \text{ of } 40 = \square \rightarrow \boxed{\text{D}}$

$25\% \text{ of } 96 = \square \rightarrow \boxed{\text{G}}$

$10\% \text{ of } 290 = \square \rightarrow \boxed{\text{I}}$

$40\% \text{ of } 10 = \square \rightarrow \boxed{\text{W}}$

$20\% \text{ of } 205 = \square \rightarrow \boxed{\text{E}}$

$40\% \text{ of } 90 = \square \rightarrow \boxed{\text{C}}$

$40\% \text{ of } 35 = \square \rightarrow \boxed{\text{Y}}$

$60\% \text{ of } 50 = \square \rightarrow \boxed{\text{H}}$

$60\% \text{ of } 45 = \square \rightarrow \boxed{\text{S}}$

$40\% \text{ of } 50 = \square \rightarrow \boxed{\text{B}}$

$25\% \text{ of } 68 = \square \rightarrow \boxed{\text{L}}$

$50\% \text{ of } 114 = \square \rightarrow \boxed{\text{A}}$

Scratch space:

Order of operations

An ancient puzzle box was dropped during the escape, its lock sealed with nested equations. Evaluate the expressions in the correct order to pop open the lid and find a scrap of colored fabric.

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

Diagram illustrating the sequence of numbers and the placement of 'T' markers across two rows of boxes.

Row 1 (Top):

- Box 1: T
- Box 2: 32
- Box 3: 69
- Box 4: 103
- Box 5: 110
- Box 6: 6
- Box 7: 87
- Box 8: 80
- Box 9: 112
- Box 10: 109
- Box 11: 32
- Box 12: T
- Box 13: 81
- Box 14: 87
- Box 15: 109
- Box 16: 42
- Box 17: 110
- Box 18: 69
- Box 19: 103
- Box 20: 33
- Box 21: 7
- Box 22: T
- Box 23: 32

Row 2 (Bottom):

- Box 1: T
- Box 2: 32
- Box 3: 69
- Box 4: 103
- Box 5: 81
- Box 6: 87
- Box 7: 7
- Box 8: 52
- Box 9: 69
- Box 10: 109
- Box 11: 42
- Box 12: 17
- Box 13: 94
- Box 14: 103
- Box 15: 7
- Box 16: 110
- Box 17: 51
- Box 18: 42

$$4 + 4 \times 7 = \boxed{} \rightarrow \boxed{\text{T}}$$

$$12 \times 4 - 6 = \boxed{} \rightarrow \boxed{\text{N}}$$

$$6 \times 4 - 17 = \boxed{} \rightarrow \boxed{\mathbf{A}}$$

$$59 + 7 \times 4 = \boxed{} \rightarrow \boxed{\text{L}}$$

$$8 \times 5 - 7 = \boxed{} \rightarrow \boxed{\text{D}}$$

$11 \times 8 - 19 = \boxed{} \rightarrow \boxed{\text{H}}$

$$11 \times 11 - 18 = \boxed{} \rightarrow \boxed{\mathbf{E}}$$

$$9 \times 4 - 30 = \boxed{} \rightarrow \boxed{\mathbf{U}}$$

$$9 \times 11 - 5 = \boxed{} \rightarrow \mathbf{B}$$

$$67 + 7 \times 2 = \boxed{} \rightarrow \boxed{\text{F}}$$

$$12 \times 11 - 22 = \boxed{} \rightarrow \boxed{\text{C}}$$

$$9 \times 6 - 3 = \boxed{} \rightarrow \boxed{0}$$

$$91 + 2 \times 9 = \boxed{} \rightarrow \boxed{\text{I}}$$

$$16 + 6 \times 6 = \boxed{} \rightarrow \boxed{\text{S}}$$

$5 + 4 \times 3 = \boxed{} \rightarrow \boxed{\mathbf{G}}$

$$45 + 5 \times 7 = \boxed{} \rightarrow \boxed{\text{P}}$$

$$85 + 9 \times 3 = \boxed{} \rightarrow \boxed{\text{R}}$$

Scratch space:

CLUE 4 Exponents

The bandit's beacon tracker emits signal waves that multiply at each relay station. By calculating the exponential growth of these waves, you pinpoint the location of the hideout and find evidence of their greatest fear.

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

W														
324	100	125	343	9	196	36	196	100	343	196	49	289	9	100
125	27	49	100	256	121	343	196	32	400	100	256	343	343	125

$18^2 = \square \rightarrow \mathbf{W}$	$10^2 = \square \rightarrow \mathbf{E}$	$11^2 = \square \rightarrow \mathbf{S}$	$14^2 = \square \rightarrow \mathbf{N}$
$7^3 = \square \rightarrow \mathbf{O}$	$20^2 = \square \rightarrow \mathbf{H}$	$4^4 = \square \rightarrow \mathbf{R}$	$3^3 = \square \rightarrow \mathbf{I}$
$6^2 = \square \rightarrow \mathbf{D}$	$7^2 = \square \rightarrow \mathbf{B}$	$2^5 = \square \rightarrow \mathbf{T}$	$3^2 = \square \rightarrow \mathbf{U}$
$17^2 = \square \rightarrow \mathbf{L}$	$5^3 = \square \rightarrow \mathbf{F}$		

Scratch space:

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

You recover a damaged flight log containing a formula for navigation trajectory. Solve the two-step equation to find the missing variable, which unlocks the final identity of the bandit.

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:

$5x + 4 = 44, x = \boxed{}$

$3x + 10 = 16, x = \boxed{}$

$3x + 9 = 18, x = \boxed{}$

$4x + 9 = 29, x = \boxed{}$

$6x + 1 = 43, x = \boxed{}$

$2x + 10 = 30, x = \boxed{}$

$4x + 12 = 48, x = \boxed{}$

$3x + 6 = 39, x = \boxed{}$

$4x + 5 = 53, x = \boxed{}$

$6x + 8 = 32, x = \boxed{}$

$2x + 4 = 6, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain fired a titanium grappling hook, then boosted high with a fuel jetpack.
2. The villain dropped a dense smoke bomb, then blinked away with a teleporter.
3. The villain extended sharp climbing claws, then drifted down on a silk parachute.
4. The villain dropped a dense smoke bomb, then drifted down on a silk parachute.
5. The villain extended sharp climbing claws, then slid down a metallic zip line.
6. The villain fired a titanium grappling hook, then floated off using a balloon belt.
7. The villain activated noisy jet boots, then drifted down on a silk parachute.
8. The villain activated noisy jet boots, then blinked away with a teleporter.
9. The villain extended sharp climbing claws, then blinked away with a teleporter.
10. The villain activated noisy jet boots, then boosted high with a fuel jetpack.
11. The villain fired a titanium grappling hook, then blinked away with a teleporter.
12. The villain dropped a dense smoke bomb, then slid down a metallic zip line.

Answer Key

The Sky-Island Compass Caper

Culprit: Marco Map

Grappling Hook · Balloon Belt · Right-handed · Neon Blue · Bright Lights

Trail: Start 21 → Clue 1 15 → Clue 2 7 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Integers): "THE BANDIT DOES NOT ESCAPE WITH A ZIP LINE"

$9 - (-4) = 13$ (T) · $29 - (-1) = 30$ (O) · $(-14) + 18 = 4$ (I) · $(-14) + 39 = 25$ (L) · $11 - (-11) = 22$ (P) · $13 - (-10) = 23$ (H) · $7 - (-2) = 9$ (Z) · $11 - (-10) = 21$ (S) · $(-14) + 19 = 5$ (A) · $(-8) + 24 = 16$ (C) · $(-6) + 12 = 6$ (D) · $3 - (-8) = 11$ (E) · $23 - (-1) = 24$ (W) · $9 - (-11) = 20$ (N) · $(-11) + 25 = 14$ (B)

Clue 2 (Percentages): "THE SCRIBBLINGS WERE MADE BY A RIGHTY"

10% of 500 = 50 (T) · 25% of 156 = 39 (R) · 10% of 350 = 35 (M) · 20% of 200 = 40 (N) · 20% of 40 = 8 (D) · 25% of 96 = 24 (G) · 10% of 290 = 29 (I) · 40% of 10 = 4 (W) · 20% of 205 = 41 (E) · 40% of 90 = 36 (C) · 40% of 35 = 14 (Y) · 60% of 50 = 30 (H) · 60% of 45 = 27 (S) · 40% of 50 = 20 (B) · 25% of 68 = 17 (L) · 50% of 114 = 57 (A)

Clue 3 (Order of operations): "THE CULPRIT FLINCHED AT THE FLASHING BEACON"

$4 + 4 \times 7 = 32$ (T) · $12 \times 4 - 6 = 42$ (N) · $6 \times 4 - 17 = 7$ (A) · $59 + 7 \times 4 = 87$ (L) · $8 \times 5 - 7 = 33$ (D) · $11 \times 8 - 19 = 69$ (H) · $11 \times 11 - 18 = 103$ (E) · $9 \times 4 - 30 = 6$ (U) · $9 \times 11 - 5 = 94$ (B) · $67 + 7 \times 2 = 81$ (F) · $12 \times 11 - 22 = 110$ (C) · $9 \times 6 - 3 = 51$ (O) · $91 + 2 \times 9 = 109$ (I) · $16 + 6 \times 6 = 52$ (S) · $5 + 4 \times 3 = 17$ (G) · $45 + 5 \times 7 = 80$ (P) · $85 + 9 \times 3 = 112$ (R)

Clue 4 (Exponents): "WE FOUND NEON BLUE FIBERS ON THE ROOF"

$18^2 = 324$ (W) · $10^2 = 100$ (E) · $11^2 = 121$ (S) · $14^2 = 196$ (N) · $7^3 = 343$ (O) · $20^2 = 400$ (H) · $4^4 = 256$ (R) · $3^3 = 27$ (I) · $6^2 = 36$ (D) · $7^2 = 49$ (B) · $2^5 = 32$ (T) · $3^2 = 9$ (U) · $17^2 = 289$ (L) · $5^3 = 125$ (F)

Clue 5 (Two-step equations): surviving statement is box 6 → Marco Map

$5x + 4 = 44, x = 8$ · $3x + 10 = 16, x = 2$ · $3x + 9 = 18, x = 3$ · $4x + 9 = 29, x = 5$ · $6x + 1 = 43, x = 7$ · $2x + 10 = 30, x = 10$ · $4x + 12 = 48, x = 9$ · $3x + 6 = 39, x = 11$ · $4x + 5 = 53, x = 12$ · $6x + 8 = 32, x = 4$ · $2x + 4 = 6, x = 1$