The Cloud Crystal Heist

Grade 9 math · Two-step equations, Exponents, Square roots, Integers · Reading level grades 5-6

Detective: _____ **Date:** _____

Someone snuck onto the flagship airship at the sky docks and stole the glowing Cloud Crystal! As lead detective of the Sky Rangers, you must examine clues left on the deck and crack the flight codes to catch the true Sky Bandit.

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.

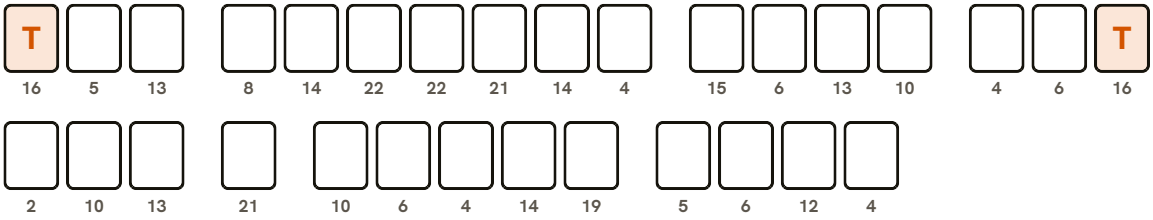
NAME	FLIGHT SKILL	GADGET USED	DOMINANT HAND	HAIR STYLE	COUNTER GADGET
Talia Frost	Thermal Soaring	Smoke Flares	Right Handed	Copper Curls	Magnet Shield
Freya Thorne	Wind Whispering	Smoke Flares	Right Handed	Silver Braids	Magnet Shield
Orion Vale	Lightning Dash	Sonic Horn	Left Handed	Copper Curls	Glow Lantern
Finn Drake	Wind Whispering	Sonic Horn	Left Handed	Copper Curls	Glow Lantern
Maya Lin	Wind Whispering	Smoke Flares	Left Handed	Copper Curls	Whistle Trap
Sienna Park	Storm Gliding	Glider Wings	Left Handed	Silver Braids	Glow Lantern
Gideon Vance	Wind Whispering	Flash Pellets	Left Handed	Raven Crop	Magnet Shield
Lyra Bel	Lightning Dash	Rope Launcher	Right Handed	Silver Braids	Glow Lantern
Skye Sterling	Thermal Soaring	Smoke Flares	Right Handed	Raven Crop	Glow Lantern
Wilbur Wright	Thermal Soaring	Rope Launcher	Right Handed	Silver Braids	Whistle Trap
Eli Hudson	Thermal Soaring	Rope Launcher	Right Handed	Raven Crop	Glow Lantern
Amelia Earhart	Grapple Hooking	Sonic Horn	Left Handed	Silver Braids	Magnet Shield
Zora Neale	Storm Gliding	Smoke Flares	Right Handed	Silver Braids	Glow Lantern
Ranger Pip	Grapple Hooking	Smoke Flares	Right Handed	Silver Braids	Glow Lantern
Rowan Croft	Wind Whispering	Flash Pellets	Right Handed	Copper Curls	Whistle Trap
Nova Cross	Wind Whispering	Glider Wings	Right Handed	Raven Crop	Whistle Trap
Jasper Vance	Lightning Dash	Flash Pellets	Right Handed	Silver Braids	Whistle Trap
Charles Lindbergh	Grapple Hooking	Sonic Horn	Right Handed	Silver Braids	Glow Lantern
Bessie Coleman	Wind Whispering	Glider Wings	Left Handed	Raven Crop	Whistle Trap
Dante Cruz	Storm Gliding	Glider Wings	Right Handed	Raven Crop	Glow Lantern
Captain Leo	Storm Gliding	Glider Wings	Right Handed	Silver Braids	Glow Lantern

make your own at mathcrackers.com

CLUE 1 Two-step equations

To unlock the airship flight log, you must calculate the missing altitude balance from the twin engine readings.

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



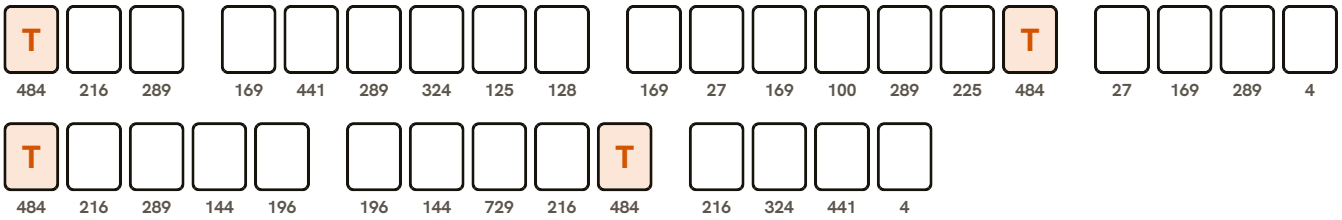
5x + 11 = 91, x = ☐ → T	4x + 9 = 25, x = ☐ → N	9x + 12 = 120, x = ☐ → R
6x + 8 = 38, x = ☐ → H	8x + 1 = 177, x = ☐ → L	8x + 6 = 118, x = ☐ → I
3x + 11 = 74, x = ☐ → A	9x + 7 = 97, x = ☐ → S	2x + 5 = 35, x = ☐ → D
4x + 9 = 41, x = ☐ → V	2x + 5 = 43, x = ☐ → C	7x + 10 = 52, x = ☐ → O
6x + 9 = 87, x = ☐ → E	7x + 2 = 16, x = ☐ → U	

Scratch space:

CLUE 2 Exponents

> The cloud radar signal grows by powers of two every second, so decrypting the ping pattern reveals where the thief flew.

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



22^2 = ☐ → T

21^2 = ☐ → N

2^2 = ☐ → D

17^2 = ☐ → E

5^3 = ☐ → K

13^2 = ☐ → S

2^7 = ☐ → Y

10^2 = ☐ → P

6^3 = ☐ → H

15^2 = ☐ → C

14^2 = ☐ → R

9^3 = ☐ → G

18^2 = ☐ → A

3^3 = ☐ → U

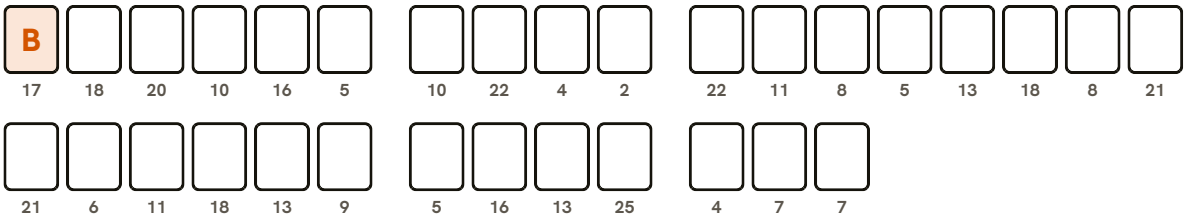
12^2 = ☐ → I

Scratch space:

CLUE 3 Square roots

> The sky dock has a square landing grid, and finding its side length helps pinpoint where the suspect dropped their map.

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



sqrt(289) = ☐ → B

sqrt(4) = ☐ → W

sqrt(441) = ☐ → S

sqrt(64) = ☐ → N

sqrt(169) = ☐ → E

sqrt(400) = ☐ → I

sqrt(121) = ☐ → A

sqrt(256) = ☐ → H

sqrt(324) = ☐ → R

sqrt(16) = ☐ → O

sqrt(25) = ☐ → T

sqrt(100) = ☐ → G

sqrt(625) = ☐ → M

sqrt(49) = ☐ → F

sqrt(36) = ☐ → C

sqrt(484) = ☐ → L

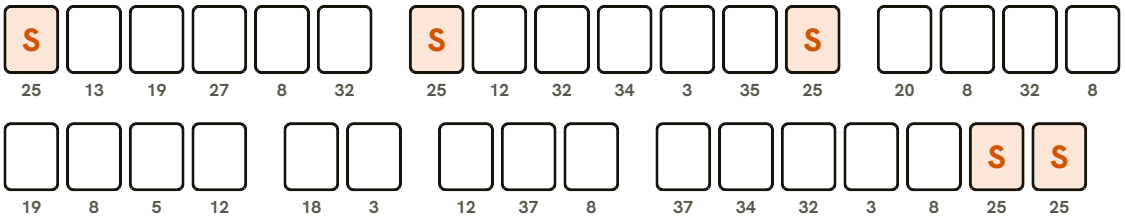
sqrt(81) = ☐ → D

Scratch space:

CLUE 4 Integers

> The wind speed gauge measures warm rising drafts as positive numbers and cold downdrafts as negative numbers to track the path.

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



(-3) + 28 = ☐ → S

(-2) + 39 = ☐ → H

(-13) + 16 = ☐ → N

(-13) + 21 = ☐ → E

(-7) + 19 = ☐ → T

17 - (-2) = ☐ → L

(-11) + 45 = ☐ → A

(-14) + 27 = ☐ → I

26 - (-6) = ☐ → R

32 - (-3) = ☐ → D

(-11) + 29 = ☐ → O

(-14) + 41 = ☐ → V

(-2) + 22 = ☐ → W

(-6) + 11 = ☐ → F

Scratch space:

CLUE 5 Two-step equations - the last clue

> To bypass the security gate on the airship deck, you need to solve the dial lock puzzle using two balancing weight steps.

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:

3x + 5 = 26, x = ☐	2x + 9 = 21, x = ☐	4x + 11 = 47, x = ☐	3x + 9 = 18, x = ☐
6x + 8 = 68, x = ☐	9x + 1 = 37, x = ☐	5x + 9 = 19, x = ☐	3x + 12 = 48, x = ☐
8x + 7 = 15, x = ☐	2x + 7 = 17, x = ☐	8x + 8 = 72, x = ☐	

Step 2 - cross out the sentence with each answer:

1. The villain swung from grapple hooks, then fired a swift rope launcher.
2. The villain soared across thermal vents, then dropped heavy smoke flares.
3. The villain swung from grapple hooks, then unfolded giant glider wings.
4. The villain soared across thermal vents, then tossed blinding flash pellets.
5. The villain whispered commands to the wind, then tossed blinding flash pellets.
6. The villain dashed like a lightning bolt, then fired a swift rope launcher.
7. The villain glided on storm currents, then unfolded giant glider wings.
8. The villain soared across thermal vents, then blared a loud sonic horn.
9. The villain glided on storm currents, then dropped heavy smoke flares.
10. The villain glided on storm currents, then blared a loud sonic horn.
11. The villain swung from grapple hooks, then dropped heavy smoke flares.
12. The villain dashed like a lightning bolt, then dropped heavy smoke flares.

TEACHER / PARENT

Answer Key

The Cloud Crystal Heist

Culprit: Ranger Pip

Grapple Hooking · Smoke Flares · Right Handed · Silver Braids · Glow Lantern

Trail: Start 21 → Clue 1 17 → Clue 2 13 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Two-step equations): "THE VILLAIN DOES NOT USE A SONIC HORN"

5x + 11 = 91, x = 16 (T) · 4x + 9 = 25, x = 4 (N) · 9x + 12 = 120, x = 12 (R) · 6x + 8 = 38, x = 5 (H) · 8x + 1 = 177, x = 22 (L) · 8x + 6 = 118, x = 14 (I) · 3x + 11 = 74, x = 21 (A) · 9x + 7 = 97, x = 10 (S) · 2x + 5 = 35, x = 15 (D) · 4x + 9 = 41, x = 8 (V) · 2x + 5 = 43, x = 19 (C) · 7x + 10 = 52, x = 6 (O) · 6x + 9 = 87, x = 13 (E) · 7x + 2 = 16, x = 2 (U)

Clue 2 (Exponents): "THE SNEAKY SUSPECT USED THEIR RIGHT HAND"

22^2 = 484 (T) · 21^2 = 441 (N) · 2^2 = 4 (D) · 17^2 = 289 (E) · 5^3 = 125 (K) · 13^2 = 169 (S) · 2^7 = 128 (Y) · 10^2 = 100 (P) · 6^3 = 216 (H) · 15^2 = 225 (C) · 14^2 = 196 (R) · 9^3 = 729 (G) · 18^2 = 324 (A) · 3^3 = 27 (U) · 12^2 = 144 (I)

Clue 3 (Square roots): "BRIGHT GLOW LANTERNS SCARED THEM OFF"

sqrt(289) = 17 (B) · sqrt(4) = 2 (W) · sqrt(441) = 21 (S) · sqrt(64) = 8 (N) · sqrt(169) = 13 (E) · sqrt(400) = 20 (I) · sqrt(121) = 11 (A) · sqrt(256) = 16 (H) · sqrt(324) = 18 (R) · sqrt(16) = 4 (O) · sqrt(25) = 5 (T) · sqrt(100) = 10 (G) · sqrt(625) = 25 (M) · sqrt(49) = 7 (F) · sqrt(36) = 6 (C) · sqrt(484) = 22 (L) · sqrt(81) = 9 (D)

Clue 4 (Integers): "SILVER STRANDS WERE LEFT ON THE HARNESS"

(-3) + 28 = 25 (S) · (-2) + 39 = 37 (H) · (-13) + 16 = 3 (N) · (-13) + 21 = 8 (E) · (-7) + 19 = 12 (T) · 17 - (-2) = 19 (L) · (-11) + 45 = 34 (A) · (-14) + 27 = 13 (I) · 26 - (-6) = 32 (R) · 32 - (-3) = 35 (D) · (-11) + 29 = 18 (O) · (-14) + 41 = 27 (V) · (-2) + 22 = 20 (W) · (-6) + 11 = 5 (F)

Clue 5 (Two-step equations): surviving statement is box 11 → Ranger Pip

3x + 5 = 26, x = 7 · 2x + 9 = 21, x = 6 · 4x + 11 = 47, x = 9 · 3x + 9 = 18, x = 3 · 6x + 8 = 68, x = 10 · 9x + 1 = 37, x = 4 · 5x + 9 = 19, x = 2 · 3x + 12 = 48, x = 12 · 8x + 7 = 15, x = 1 · 2x + 7 = 17, x = 5 · 8x + 8 = 72, x = 8