



The Cloud Kingdom Caper

Grade 10 math · Pythagorean theorem, Square roots, Exponents, Order of operations · Reading level grades 3-4

Detective: _____ **Date:** _____

A sneaky Sky Rogue has swiped the Golden Propeller from the Grand Airship! We must search the floating docks to find out who did it.

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 Rogue is _____

Possible suspects

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

NAME	AIRSHIP GEAR	SECRET GADGET	STEERING HAND	GOGGLE STRAP	BIGGEST FEAR
Long John Silver	Stealth Parachute	Smoke Bomb	Left Handed Steerer	Neon Green Strap	Sparkly Confetti
Peter Pan	Stealth Parachute	Grappling Hook	Right Handed Steerer	Bright Orange Strap	Sparkly Confetti
Phileas Fogg	Turbo Jetpack	Net Launcher	Right Handed Steerer	Sky Blue Strap	Tickle Feathers
Lara Croft	Gravity Boots	Flash Grenade	Left Handed Steerer	Sky Blue Strap	Tickle Feathers
Captain Hook	Gravity Boots	Net Launcher	Right Handed Steerer	Neon Green Strap	Loud Whistles
Marco Polo	Stealth Parachute	Smoke Bomb	Right Handed Steerer	Bright Orange Strap	Sparkly Confetti
Sinbad	Gravity Boots	Laser Pointer	Right Handed Steerer	Bright Orange Strap	Tickle Feathers
Sly Cooper	Gravity Boots	Flash Grenade	Right Handed Steerer	Bright Orange Strap	Tickle Feathers
Indiana Jones	Stealth Parachute	Smoke Bomb	Right Handed Steerer	Sky Blue Strap	Tickle Feathers
clueIntros2	Gravity Boots	Laser Pointer	Left Handed Steerer	Bright Orange Strap	Tickle Feathers
Robin Hood	Turbo Jetpack	Laser Pointer	Right Handed Steerer	Sky Blue Strap	Tickle Feathers
Sherlock Holmes	Turbo Jetpack	Grappling Hook	Left Handed Steerer	Sky Blue Strap	Loud Whistles
Amelia Earhart	Turbo Jetpack	Grappling Hook	Right Handed Steerer	Bright Orange Strap	Tickle Feathers
Jim Hawkins	Wind Glider	Grappling Hook	Left Handed Steerer	Sky Blue Strap	Sparkly Confetti
Jacques Cousteau	Gravity Boots	Flash Grenade	Right Handed Steerer	Neon Green Strap	Loud Whistles
Nancy Drew	Gravity Boots	Laser Pointer	Right Handed Steerer	Bright Orange Strap	Loud Whistles
Annie Oakley	Helicopter Pack	Flash Grenade	Left Handed Steerer	Bright Orange Strap	Loud Whistles
Sacagawea	Stealth Parachute	Net Launcher	Right Handed Steerer	Bright Orange Strap	Tickle Feathers
Sally Ride	Wind Glider	Smoke Bomb	Left Handed Steerer	Sky Blue Strap	Sparkly Confetti
Jack Sparrow	Wind Glider	Flash Grenade	Left Handed Steerer	Bright Orange Strap	Sparkly Confetti
Wendy Darling	Wind Glider	Grappling Hook	Right Handed Steerer	Bright Orange Strap	Tickle Feathers

CLUE 1

We need to measure the shortcut route between two floating docks. Let us use the grid map to calculate the exact distance.

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

116 74 50 111 26 123 82 50 100 26 50 52 20 26 116

34 13 111 111 29 13 20 50 116 17 13 82 20 34 74 50 111

legs 80 and 84, hypotenuse = $\rightarrow$ **T**

legs 8 and 15, hypotenuse = $\rightarrow$ **L**

legs 18 and 80, hypotenuse = → **U**

legs 12 and 16, hypotenuse = → **N**

legs 36 and 105, hypotenuse = → **R**

legs 27 and 120, hypotenuse = → **G**

legs 10 and 24, hypotenuse = →

legs 24 and 70, hypotenuse = $\rightarrow$ **H**

legs 5 and 12, hypotenuse = → **A**

legs 20 and 21, hypotenuse = $\rightarrow$ **Y**

legs 16 and 30, hypotenuse = $\rightarrow$ **C**

legs 20 and 48, hypotenuse = → **S**

legs 28 and 96, hypotenuse = $\rightarrow$ **D**

legs 14 and 48, hypotenuse = → **E**

Scratch space:

CLUE 2 Square roots

A square cargo container is blocking our path. We need to find its side length to squeeze past.

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

T								T									
16	15	4	22	12	10	15	16	12	20	10	22	22	15	9	7	14	
				T									T				
11	12	10	15	16	15	14	20	13	4	13	22	16	4	4	11	4	11

$$\sqrt{256} = \square \rightarrow \boxed{\text{T}}$$

$$\sqrt{196} = \square \rightarrow \boxed{\text{A}}$$

$$\sqrt{484} = \square \rightarrow \boxed{\text{S}}$$

$$\sqrt{49} = \square \rightarrow \boxed{\text{W}}$$

$$\sqrt{225} = \square \rightarrow \boxed{\text{H}}$$

$$\sqrt{169} = \square \rightarrow \boxed{\text{D}}$$

$$\sqrt{16} = \square \rightarrow \boxed{\text{E}}$$

$$\sqrt{144} = \square \rightarrow \boxed{\text{I}}$$

$$\sqrt{121} = \square \rightarrow \boxed{\text{R}}$$

$$\sqrt{81} = \square \rightarrow \boxed{\text{O}}$$

$$\sqrt{100} = \square \rightarrow \boxed{\text{G}}$$

$$\sqrt{400} = \square \rightarrow \boxed{\text{N}}$$

Scratch space:

CLUE 3

Exponents

The security tower sends out signal pulses that double every second. Let us calculate the power level.

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

T														
128	27	144	121	441	625	125	144	121	256	81	196	121	441	512

T									T				
128	49	216	25	16	144	196	144	256	128	27	144	121	169

$2^7 = \square \rightarrow$ T	$13^2 = \square \rightarrow$ S	$5^2 = \square \rightarrow$ K	$5^4 = \square \rightarrow$ G
$4^2 = \square \rightarrow$ L	$3^3 = \square \rightarrow$ H	$11^2 = \square \rightarrow$ R	$16^2 = \square \rightarrow$ A
$3^4 = \square \rightarrow$ N	$12^2 = \square \rightarrow$ E	$14^2 = \square \rightarrow$ F	$8^3 = \square \rightarrow$ M
$21^2 = \square \rightarrow$ O	$6^3 = \square \rightarrow$ C	$5^3 = \square \rightarrow$ U	$7^2 = \square \rightarrow$ I

Scratch space:

CLUE 4
Order of operations

The door to the cockpit has a golden keypad lock. We must solve the steps in the right order to open it.

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

W													
113	32	106	31	86	83	64	88	19	74	51	110	65	38

31	74	88	83	110	32	36	38	74	88	62	88	38	38	65	32

36	50	32	83	32

$11 \times 11 - 8 = \square \rightarrow \boxed{\text{W}}$

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

$10 + 3 \times 3 = \square \rightarrow \boxed{\text{B}}$

$7 \times 11 - 15 = \square \rightarrow \boxed{\text{P}}$

$9 \times 8 - 21 = \square \rightarrow \boxed{\text{I}}$

$17 + 7 \times 3 = \square \rightarrow \boxed{\text{T}}$

$6 \times 11 - 16 = \square \rightarrow \boxed{\text{C}}$

$16 + 2 \times 8 = \square \rightarrow \boxed{\text{E}}$

$9 \times 8 - 8 = \square \rightarrow \boxed{\text{D}}$

$19 + 8 \times 8 = \square \rightarrow \boxed{\text{N}}$

$62 + 3 \times 8 = \square \rightarrow \boxed{\text{U}}$

$8 \times 4 - 1 = \square \rightarrow \boxed{\text{O}}$

$38 + 9 \times 8 = \square \rightarrow \boxed{\text{G}}$

$15 + 7 \times 3 = \square \rightarrow \boxed{\text{S}}$

$53 + 2 \times 6 = \square \rightarrow \boxed{\text{H}}$

$43 + 7 \times 9 = \square \rightarrow \boxed{\text{F}}$

$38 + 9 \times 4 = \square \rightarrow \boxed{\text{R}}$

Scratch space:

CLUE 5**Square roots - the last clue**

The landing pad is a perfect square. We need the length of one side to park our rescue glider safely.

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:

$\sqrt{81} = \boxed{}$

$\sqrt{36} = \boxed{}$

$\sqrt{144} = \boxed{}$

$\sqrt{16} = \boxed{}$

$\sqrt{121} = \boxed{}$

$\sqrt{49} = \boxed{}$

$\sqrt{1} = \boxed{}$

$\sqrt{4} = \boxed{}$

$\sqrt{64} = \boxed{}$

$\sqrt{9} = \boxed{}$

$\sqrt{25} = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain clomps along using gravity boots, then fires a grappling hook to climb high.
2. The villain flies high with a helicopter pack, then throws a flash grenade to blind the guards.
3. The villain zooms past on a turbo jetpack, then shines a laser pointer to distract us.
4. The villain drifts down with a stealth parachute, then drops a smoke bomb to escape.
5. The villain sails quietly with a wind glider, then throws a flash grenade to blind the guards.
6. The villain zooms past on a turbo jetpack, then fires a grappling hook to climb high.
7. The villain clomps along using gravity boots, then drops a smoke bomb to escape.
8. The villain flies high with a helicopter pack, then fires a grappling hook to climb high.
9. The villain clomps along using gravity boots, then throws a flash grenade to blind the guards.
10. The villain clomps along using gravity boots, then shines a laser pointer to distract us.
11. The villain zooms past on a turbo jetpack, then throws a flash grenade to blind the guards.
12. The villain sails quietly with a wind glider, then fires a grappling hook to climb high.

Answer Key

The Cloud Kingdom Caper

Culprit: Sinbad

Gravity Boots · Laser Pointer · Right Handed Steerer · Bright Orange Strap · Tickle Feathers

Trail: Start 21 → Clue 1 18 → Clue 2 10 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "THE ROGUE DOES NOT CARRY A NET LAUNCHER"

legs 80 and 84, hypotenuse = 116 (T) · legs 8 and 15, hypotenuse = 17 (L) · legs 18 and 80, hypotenuse = 82 (U) · legs 12 and 16, hypotenuse = 20 (N) · legs 36 and 105, hypotenuse = 111 (R) · legs 27 and 120, hypotenuse = 123 (G) · legs 10 and 24, hypotenuse = 26 (O) · legs 24 and 70, hypotenuse = 74 (H) · legs 5 and 12, hypotenuse = 13 (A) · legs 20 and 21, hypotenuse = 29 (Y) · legs 16 and 30, hypotenuse = 34 (C) · legs 20 and 48, hypotenuse = 52 (S) · legs 28 and 96, hypotenuse = 100 (D) · legs 14 and 48, hypotenuse = 50 (E)

Clue 2 (Square roots): "THE SIGHTINGS SHOW A RIGHT HANDED STEERER"

$\sqrt{256} = 16$ (T) · $\sqrt{196} = 14$ (A) · $\sqrt{484} = 22$ (S) · $\sqrt{49} = 7$ (W) · $\sqrt{225} = 15$ (H) · $\sqrt{169} = 13$ (D) · $\sqrt{16} = 4$ (E) · $\sqrt{144} = 12$ (I) · $\sqrt{121} = 11$ (R) · $\sqrt{81} = 9$ (O) · $\sqrt{100} = 10$ (G) · $\sqrt{400} = 20$ (N)

Clue 3 (Exponents): "THE ROGUE RAN FROM TICKLE FEATHERS"

$2^7 = 128$ (T) · $13^2 = 169$ (S) · $5^2 = 25$ (K) · $5^4 = 625$ (G) · $4^2 = 16$ (L) · $3^3 = 27$ (H) · $11^2 = 121$ (R) · $16^2 = 256$ (A) · $3^4 = 81$ (N) · $12^2 = 144$ (E) · $14^2 = 196$ (F) · $8^3 = 512$ (M) · $21^2 = 441$ (O) · $6^3 = 216$ (C) · $5^3 = 125$ (U) · $7^2 = 49$ (I)

Clue 4 (Order of operations): "WE FOUND A BRIGHT ORANGE STRAP AT THE SCENE"

$11 \times 11 - 8 = 113$ (W) · $8 \times 12 - 8 = 88$ (A) · $10 + 3 \times 3 = 19$ (B) · $7 \times 11 - 15 = 62$ (P) · $9 \times 8 - 21 = 51$ (I) · $17 + 7 \times 3 = 38$ (T) · $6 \times 11 - 16 = 50$ (C) · $16 + 2 \times 8 = 32$ (E) · $9 \times 8 - 8 = 64$ (D) · $19 + 8 \times 8 = 83$ (N) · $62 + 3 \times 8 = 86$ (U) · $8 \times 4 - 1 = 31$ (O) · $38 + 9 \times 8 = 110$ (G) · $15 + 7 \times 3 = 36$ (S) · $53 + 2 \times 6 = 65$ (H) · $43 + 7 \times 9 = 106$ (F) · $38 + 9 \times 4 = 74$ (R)

Clue 5 (Square roots): surviving statement is box 10 → Sinbad

$\sqrt{81} = 9$ · $\sqrt{36} = 6$ · $\sqrt{144} = 12$ · $\sqrt{16} = 4$ · $\sqrt{121} = 11$ · $\sqrt{49} = 7$ · $\sqrt{1} = 1$ · $\sqrt{4} = 2$ · $\sqrt{64} = 8$ · $\sqrt{9} = 3$ · $\sqrt{25} = 5$