



The Sky-Pirate Cartographer's Compass

Grade 6 math · Percentages, Word problems, Exponents, Order of operations, Division · Reading level grades 7-9

Detective: _____ Date: _____

The Grand Cartographer's golden compass has vanished from the High Winds Observatory! A rogue Sky-Thief snuck past the cloud guards. We must track them across the floating islands before they map out the secret wind currents.

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-Thief is _____

Possible suspects

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

NAME	PILOT GEAR	SKY GADGET	STEERING HAND	GOGGLE STRAP COLOR	FEAR
Clark	cloud boots	spyglass	right-handed pilot	sky blue	fear of birds
Hudson	wind sails	grappling hook	left-handed pilot	neon orange	fear of heights
Polo	rotor pack	smoke bomb	left-handed pilot	sky blue	fear of lightning
Wilbur	cloud boots	grappling hook	left-handed pilot	sky blue	fear of lightning
Amelia	wind sails	flare gun	left-handed pilot	neon orange	fear of birds
Zheng	cloud boots	grappling hook	left-handed pilot	neon orange	fear of heights
Drake	rotor pack	net launcher	left-handed pilot	leather brown	fear of heights
Harriet	brass jetpack	flare gun	left-handed pilot	sky blue	fear of birds
Lewis	rotor pack	grappling hook	right-handed pilot	sky blue	fear of birds
Bly	steam glider	flare gun	right-handed pilot	leather brown	fear of heights
Cabot	wind sails	spyglass	left-handed pilot	leather brown	fear of lightning
Cook	brass jetpack	flare gun	left-handed pilot	sky blue	fear of heights
Cartier	rotor pack	spyglass	left-handed pilot	sky blue	fear of heights
Marco	cloud boots	grappling hook	right-handed pilot	sky blue	fear of heights
Nellie	brass jetpack	grappling hook	left-handed pilot	sky blue	fear of lightning
Shackleton	cloud boots	grappling hook	left-handed pilot	sky blue	fear of heights
LaSalle	cloud boots	smoke bomb	left-handed pilot	leather brown	fear of lightning
Fremont	cloud boots	spyglass	left-handed pilot	sky blue	fear of heights
Orville	brass jetpack	spyglass	right-handed pilot	sky blue	fear of lightning
Vespucci	steam glider	net launcher	right-handed pilot	neon orange	fear of lightning
Bessie	brass jetpack	smoke bomb	left-handed pilot	sky blue	fear of heights

CLUE 1 Percentages

To start the search, we must count the cargo crates scattered around the landing pad. Solve these crate inventory word problems to find where the thief fled.

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

T			T																
3	23	34	3	23	20	34	7	33	20	33	30	18	3	40	1	34			22
1	39	18	16	34	8	18	39	8											

$60\% \text{ of } 5 = \square \rightarrow \boxed{\text{T}}$

$25\% \text{ of } 72 = \square \rightarrow \boxed{\text{O}}$

$75\% \text{ of } 40 = \square \rightarrow \boxed{\text{N}}$

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

$5\% \text{ of } 400 = \square \rightarrow \boxed{\text{I}}$

$20\% \text{ of } 5 = \square \rightarrow \boxed{\text{S}}$

$10\% \text{ of } 220 = \square \rightarrow \boxed{\text{A}}$

$50\% \text{ of } 80 = \square \rightarrow \boxed{\text{U}}$

$20\% \text{ of } 80 = \square \rightarrow \boxed{\text{K}}$

$50\% \text{ of } 66 = \square \rightarrow \boxed{\text{D}}$

$10\% \text{ of } 70 = \square \rightarrow \boxed{\text{F}}$

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

$10\% \text{ of } 340 = \square \rightarrow \boxed{\text{E}}$

$25\% \text{ of } 92 = \square \rightarrow \boxed{\text{H}}$

Scratch space:

CLUE 2

Word problems

The airship's steam engine is running low on fuel. Calculate the percentage of power remaining in the cells to steer our pursuit toward the next island.

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	P	I	L	O	
83	87	18	110	26	14	71		87				83		110

Sky Scout found 70 grappling hooks yesterday and 13 more today. How many grappling hooks in all?

Answer: → **L**

Sky Scout lined up 2 rows of 7 grappling hooks. How many grappling hooks in all?

Answer: → **A**

There were 27 fuel canisters. 9 were used up. How many fuel canisters are left?

Answer: → **F**

There were 123 fuel canisters. 13 were used up. How many fuel canisters are left?

Answer: → **T**

Sky Scout found 6 wind maps yesterday and 20 more today. How many wind maps in all?

Answer: → **H**

There were 96 fuel canisters. 25 were used up. How many fuel canisters are left?

Answer: → **N**

Sky Scout found 84 fuel canisters yesterday and 3 more today. How many fuel canisters in all?

Answer: → **E**

Scratch space:

CLUE 3 Exponents

The tracker signal expands in square miles. Use exponents to figure out how far the tracking radar can reach through the thick storm clouds.

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

T												T					
169	25	343	361	289	196	16	243	36	121	196	169	324	243	81	49	64	

T											
169	25	343	25	81	4	25	125	343	225	8	

$13^2 = \square \rightarrow$ T	$2^2 = \square \rightarrow$ G	$11^2 = \square \rightarrow$ N	$7^2 = \square \rightarrow$ M
$5^2 = \square \rightarrow$ H	$17^2 = \square \rightarrow$ W	$3^5 = \square \rightarrow$ L	$2^4 = \square \rightarrow$ U
$6^2 = \square \rightarrow$ D	$2^3 = \square \rightarrow$ K	$3^4 = \square \rightarrow$ I	$19^2 = \square \rightarrow$ Y
$18^2 = \square \rightarrow$ C	$8^2 = \square \rightarrow$ B	$14^2 = \square \rightarrow$ O	$5^3 = \square \rightarrow$ P
$15^2 = \square \rightarrow$ A	$7^3 = \square \rightarrow$ E		

Scratch space:

CLUE 4 Order of operations

To unlock the high-security sky vault, we must enter the sequence in the correct order. Solve using the order of operations to crack the code.

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

T																	
58	55	27	67	78	66	55	58	78	45	66	67	55	12	24	27	31	44
67	76	6	18	68	30	27	67	58	43	44	39						

$8 \times 8 - 6 = \square \rightarrow \text{T}$	$10 \times 9 - 12 = \square \rightarrow \text{I}$	$34 + 6 \times 7 = \square \rightarrow \text{K}$
$20 + 7 \times 5 = \square \rightarrow \text{H}$	$59 + 4 \times 2 = \square \rightarrow \text{S}$	$6 \times 8 - 24 = \square \rightarrow \text{W}$
$3 + 8 \times 3 = \square \rightarrow \text{E}$	$28 + 8 \times 5 = \square \rightarrow \text{L}$	$2 \times 6 - 6 = \square \rightarrow \text{Y}$
$26 + 8 \times 5 = \square \rightarrow \text{G}$	$4 \times 11 - 14 = \square \rightarrow \text{U}$	$19 + 4 \times 5 = \square \rightarrow \text{P}$
$5 \times 8 - 22 = \square \rightarrow \text{B}$	$31 + 4 \times 3 = \square \rightarrow \text{R}$	$19 + 6 \times 2 = \square \rightarrow \text{D}$
$34 + 2 \times 5 = \square \rightarrow \text{A}$	$7 \times 9 - 18 = \square \rightarrow \text{N}$	$4 + 2 \times 4 = \square \rightarrow \text{O}$

Scratch space:

CLUE 5**Division facts (1-12) - the last clue**

We need to split our scouting team equally among the remaining sky harbors. Divide the crew to cover all escape routes.

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:

$27 \div 9 = \boxed{}$

$20 \div 2 = \boxed{}$

$108 \div 9 = \boxed{}$

$20 \div 10 = \boxed{}$

$35 \div 7 = \boxed{}$

$56 \div 7 = \boxed{}$

$6 \div 1 = \boxed{}$

$55 \div 5 = \boxed{}$

$7 \div 1 = \boxed{}$

$20 \div 5 = \boxed{}$

$81 \div 9 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain spun up their rotor pack, then scanned the horizon with a spyglass.
2. The villain activated their cloud boots, then shot a flare gun into the fog.
3. The villain activated their cloud boots, then scanned the horizon with a spyglass.
4. The villain fired up their brass jetpack, then scanned the horizon with a spyglass.
5. The villain steered their steam glider, then shot a flare gun into the fog.
6. The villain spun up their rotor pack, then tossed a smoke bomb into the clouds.
7. The villain steered their steam glider, then fired a grappling hook to escape.
8. The villain steered their steam glider, then scanned the horizon with a spyglass.
9. The villain spun up their rotor pack, then shot a flare gun into the fog.
10. The villain activated their cloud boots, then fired a grappling hook to escape.
11. The villain fired up their brass jetpack, then fired a grappling hook to escape.
12. The villain fired up their brass jetpack, then shot a flare gun into the fog.

Answer Key

The Sky-Pirate Cartographer's Compass

Culprit: Cartier

rotor pack · spyglass · left-handed pilot · sky blue · fear of heights

Trail: Start 21 → Clue 1 18 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Percentages): "THE THIEF DID NOT USE A SMOKE BOMB"

60% of 5 = 3 (T) · 25% of 72 = 18 (O) · 75% of 40 = 30 (N) · 20% of 40 = 8 (B) · 5% of 400 = 20 (I) · 20% of 5 = 1 (S) · 10% of 220 = 22 (A) · 50% of 80 = 40 (U) · 20% of 80 = 16 (K) · 50% of 66 = 33 (D) · 10% of 70 = 7 (F) · 25% of 156 = 39 (M) · 10% of 340 = 34 (E) · 25% of 92 = 23 (H)

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

Sky Scout found 70 grappling hooks yesterday and 13 more today. How many grappling hooks in all? = 83 (L) · Sky Scout lined up 2 rows of 7 grappling hooks. How many grappling hooks in all? = 14 (A) · There were 27 fuel canisters. 9 were used up. How many fuel canisters are left? = 18 (F) · There were 123 fuel canisters. 13 were used up. How many fuel canisters are left? = 110 (T) · Sky Scout found 6 wind maps yesterday and 20 more today. How many wind maps in all? = 26 (H) · There were 96 fuel canisters. 25 were used up. How many fuel canisters are left? = 71 (N) · Sky Scout found 84 fuel canisters yesterday and 3 more today. How many fuel canisters in all? = 87 (E)

Clue 3 (Exponents): "THEY WOULD NOT CLIMB THE HIGH PEAK"

$13^2 = 169$ (T) · $2^2 = 4$ (G) · $11^2 = 121$ (N) · $7^2 = 49$ (M) · $5^2 = 25$ (H) · $17^2 = 289$ (W) · $3^5 = 243$ (L) · $2^4 = 16$ (U) · $6^2 = 36$ (D) · $2^3 = 8$ (K) · $3^4 = 81$ (I) · $19^2 = 361$ (Y) · $18^2 = 324$ (C) · $8^2 = 64$ (B) · $14^2 = 196$ (O) · $5^3 = 125$ (P) · $15^2 = 225$ (A) · $7^3 = 343$ (E)

Clue 4 (Order of operations): "THE SIGHTING SHOWED A SKY BLUE STRAP"

$8 \times 8 - 6 = 58$ (T) · $10 \times 9 - 12 = 78$ (I) · $34 + 6 \times 7 = 76$ (K) · $20 + 7 \times 5 = 55$ (H) · $59 + 4 \times 2 = 67$ (S) · $6 \times 8 - 24 = 24$ (W) · $3 + 8 \times 3 = 27$ (E) · $28 + 8 \times 5 = 68$ (L) · $2 \times 6 - 6 = 6$ (Y) · $26 + 8 \times 5 = 66$ (G) · $4 \times 11 - 14 = 30$ (U) · $19 + 4 \times 5 = 39$ (P) · $5 \times 8 - 22 = 18$ (B) · $31 + 4 \times 3 = 43$ (R) · $19 + 6 \times 2 = 31$ (D) · $34 + 2 \times 5 = 44$ (A) · $7 \times 9 - 18 = 45$ (N) · $4 + 2 \times 4 = 12$ (O)

Clue 5 (Division facts (1-12)): surviving statement is box 1 → Cartier

$27 \div 9 = 3$ · $20 \div 2 = 10$ · $108 \div 9 = 12$ · $20 \div 10 = 2$ · $35 \div 7 = 5$ · $56 \div 7 = 8$ · $6 \div 1 = 6$ · $55 \div 5 = 11$ · $7 \div 1 = 7$ · $20 \div 5 = 4$ · $81 \div 9 = 9$