



The Oceanus Nebula Mystery

Grade 10 math · Pythagorean theorem, Square roots, Exponents, Order of operations · Reading level grades 7-9

Detective: _____ Date: _____

A sabotage alarm rings across the floating liquid corridors of Oceanus Station. An unknown rogue siren bypassed security and disrupted the central hydro reactor. Detective, analyze the physical evidence and match the saboteur to the suspect roster.

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 Rogue Siren is _____

Possible suspects

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

NAME	COSMIC ABILITY	STARLIGHT GEAR	GLOW PATTERN	FIN COLOR	DISRUPTION RESONANCE
Nerida Cosmos	Nebular Blast	Meteor Anchor	Left Fin Pulsing	Nebula Purple	High Pitch Sonar
Ceto Parallax	Solar Hydro Jet	Meteor Anchor	Left Fin Pulsing	Nebula Purple	High Pitch Sonar
Hyperion Reef	Solar Hydro Jet	Meteor Anchor	Right Fin Pulsing	Deep Void Black	High Pitch Sonar
Caspian Drake	Nebular Blast	Comet Shield	Left Fin Pulsing	Nebula Purple	Magnetic Pulse
Halimede Drift	Solar Hydro Jet	Crystal Helm	Left Fin Pulsing	Bioluminescent Cyan	Magnetic Pulse
Triton Rigel	Solar Hydro Jet	Flare Jetpack	Left Fin Pulsing	Deep Void Black	Ultraviolet Flash
Oceanus Vane	Gravity Whalesong	Crystal Helm	Left Fin Pulsing	Nebula Purple	High Pitch Sonar
Tritonis Void	Nebular Blast	Meteor Anchor	Left Fin Pulsing	Deep Void Black	Magnetic Pulse
Galatea Zenith	Solar Hydro Jet	Plasma Trident	Right Fin Pulsing	Deep Void Black	High Pitch Sonar
Callisto Fin	Gravity Whalesong	Meteor Anchor	Left Fin Pulsing	Nebula Purple	High Pitch Sonar
Triton Vega	Nebular Blast	Comet Shield	Left Fin Pulsing	Bioluminescent Cyan	High Pitch Sonar
Glaucus Ray	Starlight Cloaking	Flare Jetpack	Left Fin Pulsing	Bioluminescent Cyan	High Pitch Sonar
Proteus Flare	Starlight Cloaking	Flare Jetpack	Right Fin Pulsing	Nebula Purple	High Pitch Sonar
Tiberius Wave	Starlight Cloaking	Plasma Trident	Left Fin Pulsing	Bioluminescent Cyan	Magnetic Pulse
Maris Nova	Solar Hydro Jet	Flare Jetpack	Right Fin Pulsing	Bioluminescent Cyan	Magnetic Pulse
Nereus Thorne	Starlight Cloaking	Meteor Anchor	Left Fin Pulsing	Nebula Purple	High Pitch Sonar
Astra Marina	Tidal Telekinesis	Comet Shield	Right Fin Pulsing	Deep Void Black	Magnetic Pulse
Delphine Helix	Starlight Cloaking	Meteor Anchor	Left Fin Pulsing	Nebula Purple	Magnetic Pulse
Amphitrite Sol	Tidal Telekinesis	Comet Shield	Right Fin Pulsing	Bioluminescent Cyan	High Pitch Sonar
Thalassa Orion	Nebular Blast	Plasma Trident	Left Fin Pulsing	Bioluminescent Cyan	High Pitch Sonar
Doris Quasar	Tidal Telekinesis	Comet Shield	Right Fin Pulsing	Nebula Purple	High Pitch Sonar

CLUE 1

Pythagorean theorem

Navigation logs map the villain escape vector across a two dimensional grid using perpendicular coordinates.

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

T																T
25	111	34	52	125	85	85	29	125	41	87	65	34	39	41	65	25
58	39	34	29	5	40	68	39	25	29	85	111	34	85	26		

legs 15 and 20, hypotenuse = → **T**

legs 20 and 48, hypotenuse = → **V**

legs 40 and 42, hypotenuse = → **U**

legs 15 and 36, hypotenuse = → **S**

legs 25 and 60, hypotenuse = → **O**

legs 9 and 40, hypotenuse = → **N**

legs 3 and 4, hypotenuse = → **C**

legs 16 and 30, hypotenuse = → **E**

legs 60 and 63, hypotenuse = → **D**

legs 10 and 24, hypotenuse = → **M**

legs 40 and 75, hypotenuse = → **L**

legs 35 and 120, hypotenuse = → **I**

legs 24 and 32, hypotenuse = → **R**

legs 32 and 60, hypotenuse = → **Y**

legs 20 and 21, hypotenuse = → **A**

legs 36 and 105, hypotenuse = → **H**

Scratch space:

CLUE 2 Square roots

The emergency lockdown panel requires calculating the side length of a square hydro containment bay.

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

W									W							
2	20	4	6	23	14	14	14	15	2	10	23	19	4	19	20	6
12	7	10	14	20	6	13	15	4	4	24	23	14	5	23	6	23

$\sqrt{4} = \square \rightarrow \boxed{W}$

$\sqrt{196} = \square \rightarrow \boxed{S}$

$\sqrt{361} = \square \rightarrow \boxed{F}$

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

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

$\sqrt{49} = \square \rightarrow \boxed{U}$

$\sqrt{36} = \square \rightarrow \boxed{N}$

$\sqrt{100} = \square \rightarrow \boxed{L}$

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

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

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

$\sqrt{400} = \square \rightarrow \boxed{I}$

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

$\sqrt{16} = \square \rightarrow \boxed{T}$

Scratch space:

CLUE 3

Exponents

Sensor array readings show energy surging exponentially across the cosmic station power grid.

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

H			H					H											
324	81	243	324	100	81	4	64	324	32	289	400	25	256	729	256	289	27	225	
	H																		
4	324	225	27	81	144	144	25	81	400	125	25	64	128						

$18^2 = \square \rightarrow \boxed{\text{H}}$

$15^2 = \square \rightarrow \boxed{\text{E}}$

$16^2 = \square \rightarrow \boxed{\text{R}}$

$20^2 = \square \rightarrow \boxed{\text{N}}$

$2^2 = \square \rightarrow \boxed{\text{T}}$

$3^3 = \square \rightarrow \boxed{\text{V}}$

$2^7 = \square \rightarrow \boxed{\text{K}}$

$17^2 = \square \rightarrow \boxed{\text{O}}$

$9^2 = \square \rightarrow \boxed{\text{I}}$

$10^2 = \square \rightarrow \boxed{\text{P}}$

$4^3 = \square \rightarrow \boxed{\text{C}}$

$2^5 = \square \rightarrow \boxed{\text{S}}$

$9^3 = \square \rightarrow \boxed{\text{D}}$

$5^3 = \square \rightarrow \boxed{\text{B}}$

$12^2 = \square \rightarrow \boxed{\text{L}}$

$5^2 = \square \rightarrow \boxed{\text{A}}$

$3^5 = \square \rightarrow \boxed{\text{G}}$

Scratch space:

CLUE 4
Order of operations

Decrypting the security override vault demands evaluating multi step operational equations correctly.

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

P			P														
56	24	25	56	27	72	66	26	92	29	26	93	93	24	72	108	102	93
66	52	24	92	95	92	72	102	25	29	103	72	27	52	58	82		

$16 + 5 \times 8 = \square \rightarrow \text{P}$

$11 \times 9 - 17 = \square \rightarrow \text{K}$

$65 + 9 \times 3 = \square \rightarrow \text{N}$

$78 + 3 \times 5 = \square \rightarrow \text{S}$

$12 \times 3 - 7 = \square \rightarrow \text{T}$

$10 \times 10 - 28 = \square \rightarrow \text{E}$

$5 \times 11 - 28 = \square \rightarrow \text{L}$

$81 + 3 \times 7 = \square \rightarrow \text{A}$

$24 + 4 \times 7 = \square \rightarrow \text{O}$

$84 + 8 \times 3 = \square \rightarrow \text{W}$

$10 + 7 \times 2 = \square \rightarrow \text{U}$

$15 + 5 \times 2 = \square \rightarrow \text{R}$

$83 + 4 \times 5 = \square \rightarrow \text{H}$

$10 \times 10 - 5 = \square \rightarrow \text{D}$

$48 + 3 \times 6 = \square \rightarrow \text{F}$

$16 + 7 \times 6 = \square \rightarrow \text{C}$

$20 + 3 \times 2 = \square \rightarrow \text{I}$

Scratch space:

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

Final tracking radar calculates the precise radius of a square forcefield generator room.

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:

$\text{sqrt}(49) =$

$\text{sqrt}(25) =$

$\text{sqrt}(100) =$

$\text{sqrt}(81) =$

$\text{sqrt}(36) =$

$\text{sqrt}(144) =$

$\text{sqrt}(9) =$

$\text{sqrt}(4) =$

$\text{sqrt}(121) =$

$\text{sqrt}(64) =$

$\text{sqrt}(1) =$

Step 2 - cross out the sentence with each answer:

1. The villain used tidal telekinesis, then deployed a comet shield.
2. The villain used tidal telekinesis, then dropped a meteor anchor.
3. The villain sang a gravity whalesong, then fired a flare jetpack.
4. The villain fired a nebular blast, then dropped a meteor anchor.
5. The villain sang a gravity whalesong, then dropped a meteor anchor.
6. The villain engaged a solar hydro jet, then swung a plasma trident.
7. The villain engaged a solar hydro jet, then dropped a meteor anchor.
8. The villain activated starlight cloaking, then adjusted a crystal helm.
9. The villain fired a nebular blast, then fired a flare jetpack.
10. The villain activated starlight cloaking, then dropped a meteor anchor.
11. The villain fired a nebular blast, then deployed a comet shield.
12. The villain activated starlight cloaking, then fired a flare jetpack.

Answer Key

The Oceanus Nebula Mystery

Culprit: Nerida Cosmos

Nebular Blast · Meteor Anchor · Left Fin Pulsing · Nebula Purple · High Pitch Sonar

Trail: Start 21 → Clue 1 19 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "THE VILLAIN DOES NOT USE A CRYSTAL HELM"

legs 15 and 20, hypotenuse = 25 (T) · legs 20 and 48, hypotenuse = 52 (V) · legs 40 and 42, hypotenuse = 58 (U) · legs 15 and 36, hypotenuse = 39 (S) · legs 25 and 60, hypotenuse = 65 (O) · legs 9 and 40, hypotenuse = 41 (N) · legs 3 and 4, hypotenuse = 5 (C) · legs 16 and 30, hypotenuse = 34 (E) · legs 60 and 63, hypotenuse = 87 (D) · legs 10 and 24, hypotenuse = 26 (M) · legs 40 and 75, hypotenuse = 85 (L) · legs 35 and 120, hypotenuse = 125 (I) · legs 24 and 32, hypotenuse = 40 (R) · legs 32 and 60, hypotenuse = 68 (Y) · legs 20 and 21, hypotenuse = 29 (A) · legs 36 and 105, hypotenuse = 111 (H)

Clue 2 (Square roots): "WITNESS SAW LEFT FIN PULSING AT THE SCENE"

$\sqrt{4} = 2$ (W) · $\sqrt{196} = 14$ (S) · $\sqrt{361} = 19$ (F) · $\sqrt{144} = 12$ (P) · $\sqrt{25} = 5$ (C) · $\sqrt{49} = 7$ (U) · $\sqrt{36} = 6$ (N) · $\sqrt{100} = 10$ (L) · $\sqrt{225} = 15$ (A) · $\sqrt{529} = 23$ (E) · $\sqrt{169} = 13$ (G) · $\sqrt{400} = 20$ (I) · $\sqrt{576} = 24$ (H) · $\sqrt{16} = 4$ (T)

Clue 3 (Exponents): "HIGH PITCH SONAR DROVE THE VILLAIN BACK"

$18^2 = 324$ (H) · $15^2 = 225$ (E) · $16^2 = 256$ (R) · $20^2 = 400$ (N) · $2^2 = 4$ (T) · $3^3 = 27$ (V) · $2^7 = 128$ (K) · $17^2 = 289$ (O) · $9^2 = 81$ (I) · $10^2 = 100$ (P) · $4^3 = 64$ (C) · $2^5 = 32$ (S) · $9^3 = 729$ (D) · $5^3 = 125$ (B) · $12^2 = 144$ (L) · $5^2 = 25$ (A) · $3^5 = 243$ (G)

Clue 4 (Order of operations): "PURPLE FIN TISSUE WAS FOUND NEAR THE LOCK"

$16 + 5 \times 8 = 56$ (P) · $11 \times 9 - 17 = 82$ (K) · $65 + 9 \times 3 = 92$ (N) · $78 + 3 \times 5 = 93$ (S) · $12 \times 3 - 7 = 29$ (T) · $10 \times 10 - 28 = 72$ (E) · $5 \times 11 - 28 = 27$ (L) · $81 + 3 \times 7 = 102$ (A) · $24 + 4 \times 7 = 52$ (O) · $84 + 8 \times 3 = 108$ (W) · $10 + 7 \times 2 = 24$ (U) · $15 + 5 \times 2 = 25$ (R) · $83 + 4 \times 5 = 103$ (H) · $10 \times 10 - 5 = 95$ (D) · $48 + 3 \times 6 = 66$ (F) · $16 + 7 \times 6 = 58$ (C) · $20 + 3 \times 2 = 26$ (I)

Clue 5 (Square roots): surviving statement is box 4 → Nerida Cosmos

$\sqrt{49} = 7$ · $\sqrt{25} = 5$ · $\sqrt{100} = 10$ · $\sqrt{81} = 9$ · $\sqrt{36} = 6$ · $\sqrt{144} = 12$ · $\sqrt{9} = 3$ · $\sqrt{4} = 2$ · $\sqrt{121} = 11$ · $\sqrt{64} = 8$ · $\sqrt{1} = 1$