



The Abyss Vault Heist

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

Detective: _____ **Date:** _____

A high-tech energy core was stolen from the ocean floor laboratory. Track the clue logs to find out which suspect pulled off the dive!

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 diver is _____

Possible suspects

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

NAME	SUBMARINE GEAR	SPECIALIST SKILL	WATCH WRIST	WETSUIT HOOD	GLOVE TYPE
Diver Owen	Thermal Shield	Deep Diving	Left Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Specialist Zoe	Plasma Torch	Code Breaking	Right Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Specialist Chloe	Grapple Arm	Deep Diving	Right Wrist Watch	Bright Yellow Hood	Rubber Grip Gloves
Specialist Sam	Grapple Arm	Code Breaking	Left Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Diver Liam	Stealth Propulsion	Code Breaking	Left Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Pilot Ethan	Thermal Shield	Deep Diving	Left Wrist Watch	Bright Yellow Hood	Thermal Padded Gloves
Engineer Frank	Stealth Propulsion	Laser Cutting	Left Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Capt Aronnax	Sonar Array	Laser Cutting	Right Wrist Watch	Dark Black Hood	Rubber Grip Gloves
Engineer Kai	Sonar Array	Pressure Tuning	Left Wrist Watch	Neon Blue Hood	Rubber Grip Gloves
Commander Jacques	Plasma Torch	Laser Cutting	Left Wrist Watch	Bright Yellow Hood	Kevlar Mesh Gloves
Tech Mateo	Grapple Arm	Code Breaking	Right Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Tech Caleb	Thermal Shield	Pressure Tuning	Right Wrist Watch	Neon Blue Hood	Rubber Grip Gloves
Tech Maya Lin	Grapple Arm	Deep Diving	Left Wrist Watch	Bright Yellow Hood	Rubber Grip Gloves
Dr James Reed	Plasma Torch	Pressure Tuning	Right Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Pilot Tara	Stealth Propulsion	Laser Cutting	Left Wrist Watch	Neon Blue Hood	Rubber Grip Gloves
Dr Victor Vance	Plasma Torch	Hydro Navigation	Left Wrist Watch	Neon Blue Hood	Thermal Padded Gloves
Diver Leo	Thermal Shield	Hydro Navigation	Right Wrist Watch	Neon Blue Hood	Rubber Grip Gloves
Dr Sylvia Earle	Grapple Arm	Laser Cutting	Right Wrist Watch	Dark Black Hood	Kevlar Mesh Gloves
Pilot Jax	Stealth Propulsion	Pressure Tuning	Left Wrist Watch	Bright Yellow Hood	Thermal Padded Gloves
Pilot Nora	Thermal Shield	Pressure Tuning	Left Wrist Watch	Neon Blue Hood	Kevlar Mesh Gloves
Officer Ben	Thermal Shield	Hydro Navigation	Right Wrist Watch	Neon Blue Hood	Thermal Padded Gloves

CLUE 1 Integers

The submarine temperature logs recorded extreme elevation changes above and below sea level to reveal the first evidence.

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

T																T		
8	25	3	24	26	20	20	21	26	11	30	29	3	7	11	29	8		
4	7	3	30	3	3	28	30	26	24	26	11	15	7	14	26	20	20	7

$(-9) + 17 = \square \rightarrow$ T	$(-6) + 34 = \square \rightarrow$ P	$19 - (-11) = \square \rightarrow$ D
$(-4) + 29 = \square \rightarrow$ H	$(-7) + 31 = \square \rightarrow$ V	$1 - (-2) = \square \rightarrow$ E
$(-1) + 27 = \square \rightarrow$ I	$(-3) + 17 = \square \rightarrow$ K	$(-13) + 42 = \square \rightarrow$ O
$(-2) + 23 = \square \rightarrow$ A	$(-6) + 21 = \square \rightarrow$ G	$(-12) + 19 = \square \rightarrow$ S
$6 - (-5) = \square \rightarrow$ N	$(-8) + 28 = \square \rightarrow$ L	$(-5) + 9 = \square \rightarrow$ U

Scratch space:

CLUE 2

Security sensors calculated the percentage of battery depletion across each underwater sector during the breach.

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

25% of 76 = → **T**

10% of 220 = → **H**

50% of 64 = → ☐

10% of 230 = → **L**

5% of 880 = → **F**

50% of 34 = → **W**

25% of 212 = → **S**

5% of 480 = → **C**

25% of 28 = → **N**

10% of 330 = → **R**

5% of 260 = → **A**

40% of 50 = →

20% of 80 = → **E**

Scratch space:

CLUE 3

Order of operations

Decoding the station security sequence required evaluating multi-step energy equations in order.

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

T																			
26	14	24	100	13	59	40	45	59	86	86	24	86	69	40	77	91	24	28	
					T			T							T	T			
100	24	28	37	28	26	24	86	26	14	24	93	100	77	28	26	26	100	59	45

$11 + 5 \times 3 = \square \rightarrow \boxed{\text{T}}$

$5 \times 11 - 18 = \square \rightarrow \boxed{\text{I}}$

$11 \times 11 - 30 = \square \rightarrow \boxed{\text{V}}$

$10 \times 2 - 6 = \square \rightarrow \boxed{\text{H}}$

$12 \times 3 - 8 = \square \rightarrow \boxed{\text{S}}$

$11 \times 9 - 30 = \square \rightarrow \boxed{\text{G}}$

$12 \times 7 - 7 = \square \rightarrow \boxed{\text{O}}$

$28 + 3 \times 4 = \square \rightarrow \boxed{\text{L}}$

$14 + 9 \times 5 = \square \rightarrow \boxed{\text{A}}$

$10 \times 11 - 17 = \square \rightarrow \boxed{\text{F}}$

$5 \times 8 - 27 = \square \rightarrow \boxed{\text{M}}$

$11 \times 8 - 2 = \square \rightarrow \boxed{\text{D}}$

$17 + 4 \times 7 = \square \rightarrow \boxed{\text{P}}$

$96 + 2 \times 2 = \square \rightarrow \boxed{\text{R}}$

$4 \times 9 - 12 = \square \rightarrow \boxed{\text{E}}$

Scratch space:

CLUE 4

Exponents

Pressure growth calculations followed exponential curves as the rogue sub descended into the trench.

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

N			N														
361	32	256	361	289	243	49	32	81	256	256	8	27	169	289	36	64	100
										N							
324	169	128	100	169	49	16	81	125	256	361	81	169	125	100	81		

$19^2 = \square \rightarrow \text{N}$

$2^5 = \square \rightarrow \text{E}$

$3^3 = \square \rightarrow \text{F}$

$9^2 = \square \rightarrow \text{H}$

$2^7 = \square \rightarrow \text{S}$

$10^2 = \square \rightarrow \text{C}$

$6^2 = \square \rightarrow \text{R}$

$4^2 = \square \rightarrow \text{G}$

$5^3 = \square \rightarrow \text{T}$

$13^2 = \square \rightarrow \text{A}$

$16^2 = \square \rightarrow \text{O}$

$3^5 = \square \rightarrow \text{L}$

$17^2 = \square \rightarrow \text{B}$

$8^2 = \square \rightarrow \text{I}$

$2^3 = \square \rightarrow \text{D}$

$7^2 = \square \rightarrow \text{U}$

$18^2 = \square \rightarrow \text{W}$

Scratch space:

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

Solving the station automated ballast gate codes required solving two-step balance equations.

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:

$3x + 12 = 39, x = \boxed{}$

$6x + 10 = 58, x = \boxed{}$

$4x + 8 = 20, x = \boxed{}$

$3x + 9 = 42, x = \boxed{}$

$2x + 12 = 20, x = \boxed{}$

$2x + 2 = 22, x = \boxed{}$

$3x + 5 = 20, x = \boxed{}$

$5x + 9 = 44, x = \boxed{}$

$6x + 4 = 76, x = \boxed{}$

$5x + 1 = 31, x = \boxed{}$

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

Step 2 - cross out the sentence with each answer:

1. The villain engaged stealth propulsion, then managed pressure tuning.
2. The villain fired the plasma torch, then handled hydro navigation.
3. The villain engaged stealth propulsion, then performed laser cutting.
4. The villain activated the sonar array, then completed code breaking.
5. The villain charged the thermal shield, then handled hydro navigation.
6. The villain activated the sonar array, then handled hydro navigation.
7. The villain deployed the grapple arm, then handled hydro navigation.
8. The villain deployed the grapple arm, then completed code breaking.
9. The villain engaged stealth propulsion, then completed code breaking.
10. The villain fired the plasma torch, then completed code breaking.
11. The villain fired the plasma torch, then managed pressure tuning.
12. The villain charged the thermal shield, then performed laser cutting.

Answer Key

The Abyss Vault Heist

Culprit: Dr Victor Vance

Plasma Torch · Hydro Navigation · Left Wrist Watch · Neon Blue Hood · Thermal Padded Gloves

Trail: Start 21 → Clue 1 17 → Clue 2 9 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Integers): "THE VILLAIN DOES NOT USE DEEP DIVING SKILLS"

$(-9) + 17 = 8$ (T) · $(-6) + 34 = 28$ (P) · $19 - (-11) = 30$ (D) · $(-4) + 29 = 25$ (H) · $(-7) + 31 = 24$ (V) · $1 - (-2) = 3$ (E) · $(-1) + 27 = 26$ (I) · $(-3) + 17 = 14$ (K) · $(-13) + 42 = 29$ (O) · $(-2) + 23 = 21$ (A) · $(-6) + 21 = 15$ (G) · $(-12) + 19 = 7$ (S) · $6 - (-5) = 11$ (N) · $(-8) + 28 = 20$ (L) · $(-5) + 9 = 4$ (U)

Clue 2 (Percentages): "THE WITNESS SAW A WATCH ON THE LEFT WRIST"

25% of 76 = 19 (T) · 10% of 220 = 22 (H) · 50% of 64 = 32 (O) · 10% of 230 = 23 (L) · 5% of 880 = 44 (F) · 50% of 34 = 17 (W) · 25% of 212 = 53 (S) · 5% of 480 = 24 (C) · 25% of 28 = 7 (N) · 10% of 330 = 33 (R) · 5% of 260 = 13 (A) · 40% of 50 = 20 (I) · 20% of 80 = 16 (E)

Clue 3 (Order of operations): "THERMAL PADDED GLOVES RESISTED THE FROST TRAP"

$11 + 5 \times 3 = 26$ (T) · $5 \times 11 - 18 = 37$ (I) · $11 \times 11 - 30 = 91$ (V) · $10 \times 2 - 6 = 14$ (H) · $12 \times 3 - 8 = 28$ (S) · $11 \times 9 - 30 = 69$ (G) · $12 \times 7 - 7 = 77$ (O) · $28 + 3 \times 4 = 40$ (L) · $14 + 9 \times 5 = 59$ (A) · $10 \times 11 - 17 = 93$ (F) · $5 \times 8 - 27 = 13$ (M) · $11 \times 8 - 2 = 86$ (D) · $17 + 4 \times 7 = 45$ (P) · $96 + 2 \times 2 = 100$ (R) · $4 \times 9 - 12 = 24$ (E)

Clue 4 (Exponents): "NEON BLUE HOOD FABRIC WAS CAUGHT ON HATCH"

$19^2 = 361$ (N) · $2^5 = 32$ (E) · $3^3 = 27$ (F) · $9^2 = 81$ (H) · $2^7 = 128$ (S) · $10^2 = 100$ (C) · $6^2 = 36$ (R) · $4^2 = 16$ (G) · $5^3 = 125$ (T) · $13^2 = 169$ (A) · $16^2 = 256$ (O) · $3^5 = 243$ (L) · $17^2 = 289$ (B) · $8^2 = 64$ (I) · $2^3 = 8$ (D) · $7^2 = 49$ (U) · $18^2 = 324$ (W)

Clue 5 (Two-step equations): surviving statement is box 2 → Dr Victor Vance

$3x + 12 = 39, x = 9$ · $6x + 10 = 58, x = 8$ · $4x + 8 = 20, x = 3$ · $3x + 9 = 42, x = 11$ · $2x + 12 = 20, x = 4$ · $2x + 2 = 22, x = 10$ · $3x + 5 = 20, x = 5$ · $5x + 9 = 44, x = 7$ · $6x + 4 = 76, x = 12$ · $5x + 1 = 31, x = 6$ · $2x + 4 = 6, x = 1$