



The Great Capacity Caper

Grade 10 math · Fractions of a number, Multiplication, Rounding, Pythagorean theorem · Reading level grades 7-9

Detective: _____ Date: _____

The central Hydro-Vault has been breached! A rogue agent has drained the master reservoirs of their precious super-fluids. We must calculate the remaining capacities to track down the thief.

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 Liquid Thief is _____

Possible suspects

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

NAME	GEAR	STOLEN FLUID	EYEWEAR	HAIR COLOR	VULNERABILITY
Robert Boyle	Funnel Mask	Glitch Serum	Wears Goggles	Chrome Silver Hair	Absorbent Sponge
Nikolaus Otto	Valve Wrench	Neon Elixir	Wears Goggles	Chrome Silver Hair	Dry Sand
Amedeo Avogadro	Graduated Beaker	Glitch Serum	Wears Goggles	Spiky Blue Hair	Dry Sand
Jacques Charles	Valve Wrench	Magna Juice	No Goggles	Chrome Silver Hair	Absorbent Sponge
Evangelista Torricelli	Siphon Hose	Magna Juice	No Goggles	Neon Green Hair	Freeze Ray
Lord Kelvin	Funnel Mask	Heavy Water	No Goggles	Chrome Silver Hair	Absorbent Sponge
Yen Wing	Valve Wrench	Magna Juice	No Goggles	Neon Green Hair	Freeze Ray
Thomas Newcomen	Valve Wrench	Heavy Water	No Goggles	Neon Green Hair	Dry Sand
Terry Benedict	Pump Boots	Neon Elixir	No Goggles	Chrome Silver Hair	Absorbent Sponge
Frank Catton	Graduated Beaker	Heavy Water	No Goggles	Neon Green Hair	Absorbent Sponge
John Dalton	Graduated Beaker	Magna Juice	Wears Goggles	Chrome Silver Hair	Dry Sand
Joseph Gay Lussac	Siphon Hose	Solar Fuel	Wears Goggles	Neon Green Hair	Freeze Ray
Daniel Bernoulli	Valve Wrench	Glitch Serum	No Goggles	Neon Green Hair	Absorbent Sponge
Danny Ocean	Funnel Mask	Neon Elixir	Wears Goggles	Spiky Blue Hair	Absorbent Sponge
Rusty Ryan	Valve Wrench	Magna Juice	Wears Goggles	Spiky Blue Hair	Dry Sand
Rudolf Diesel	Siphon Hose	Neon Elixir	No Goggles	Chrome Silver Hair	Freeze Ray
Marie Curie	Pump Boots	Magna Juice	No Goggles	Chrome Silver Hair	Freeze Ray
Linus Caldwell	Graduated Beaker	Glitch Serum	No Goggles	Chrome Silver Hair	Absorbent Sponge
Basher Tarr	Siphon Hose	Solar Fuel	Wears Goggles	Spiky Blue Hair	Absorbent Sponge
Antoine Lavoisier	Valve Wrench	Heavy Water	Wears Goggles	Chrome Silver Hair	Freeze Ray
James Watt	Siphon Hose	Heavy Water	No Goggles	Chrome Silver Hair	Absorbent Sponge

CLUE 1
Fractions of a number

To find the first lead, we must figure out what fraction of the main reservoir was successfully drained before the alarm cut off the pumps.

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

T			T										T					
18	51	31	18	51	2	31	43	21	2	21	30	47	18	55	18	31	32	59
T																		
18	51	31	3	32	25	30	32	17	44	2	53	31						

$6/8 \text{ of } 24 = \square \rightarrow \text{T}$

$1/3 \text{ of } 159 = \square \rightarrow \text{C}$

$6/8 \text{ of } 68 = \square \rightarrow \text{H}$

$1/3 \text{ of } 75 = \square \rightarrow \text{G}$

$3/5 \text{ of } 35 = \square \rightarrow \text{D}$

$8/10 \text{ of } 40 = \square \rightarrow \text{A}$

$2/5 \text{ of } 110 = \square \rightarrow \text{U}$

$4/8 \text{ of } 110 = \square \rightarrow \text{S}$

$1/6 \text{ of } 12 = \square \rightarrow \text{I}$

$2/6 \text{ of } 51 = \square \rightarrow \text{J}$

$2/4 \text{ of } 118 = \square \rightarrow \text{L}$

$1/3 \text{ of } 93 = \square \rightarrow \text{E}$

$3/8 \text{ of } 8 = \square \rightarrow \text{M}$

$2/3 \text{ of } 45 = \square \rightarrow \text{N}$

$1/2 \text{ of } 86 = \square \rightarrow \text{F}$

$2/4 \text{ of } 94 = \square \rightarrow \text{O}$

Scratch space:

CLUE 2
Multiplication facts (1-12)

The thief fled down the storage corridor. To see how many total liters they managed to carry, we must multiply the number of crates by their volume capacity.

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

N																	
18	96	25	96	25	25	108	54	20	2	8	45	24	48	45	8	1	20
14	54	8	54	108	54	21	2	80	54	63	99	18	15				

$9 \times 2 = \square \rightarrow$ N	$11 \times 9 = \square \rightarrow$ I	$5 \times 3 = \square \rightarrow$ D	$5 \times 5 = \square \rightarrow$ G
$2 \times 10 = \square \rightarrow$ S	$7 \times 9 = \square \rightarrow$ H	$3 \times 8 = \square \rightarrow$ P	$6 \times 9 = \square \rightarrow$ E
$2 \times 7 = \square \rightarrow$ W	$9 \times 5 = \square \rightarrow$ A	$10 \times 8 = \square \rightarrow$ B	$7 \times 3 = \square \rightarrow$ F
$8 \times 12 = \square \rightarrow$ O	$2 \times 1 = \square \rightarrow$ T	$12 \times 9 = \square \rightarrow$ L	
$1 \times 8 = \square \rightarrow$ R	$1 \times 1 = \square \rightarrow$ K	$6 \times 8 = \square \rightarrow$ M	

Scratch space:

CLUE 3

Rounding

The backup pressure gauge only displays values rounded to the nearest ten liters. We need to round the scanner data to read the correct pressure level.

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

T			T															T
1700	110	900	1700	110	200	900	3000	430	50	370	3000	430	290	2900	50	500	900	1700
30	2000	290	370	20	900													

Round 1,689 to the nearest hundred → **T**

Round 1,619 to the nearest thousand → **P**

Round 291 to the nearest ten → **O**

Round 2,931 to the nearest thousand → **F**

Round 367 to the nearest ten → **N**

Round 48 to the nearest ten → **A**

Round 18 to the nearest ten → **G**

Round 114 to the nearest ten → **H**

Round 2,852 to the nearest hundred → **M**

Round 865 to the nearest hundred → **E**

Round 163 to the nearest hundred → **I**

Round 434 to the nearest ten → **R**

Round 500 to the nearest hundred → **W**

Round 26 to the nearest ten → **S**

Scratch space:

CLUE 4
Pythagorean theorem

The thief used a zip-line from the top of the tank to the emergency exit. We can find the length of their escape route by calculating the hypotenuse of the triangle.

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

A																	A		
30	37	17	10	87	85	41	65	25	39	15	41	10	65	52	10	30	13	123	

	A											
34	30	65	87	13	52	17	41	75	39	87	87	10

legs 18 and 24, hypotenuse = → **A**

legs 16 and 30, hypotenuse = → **W**

legs 6 and 8, hypotenuse = → **R**

legs 9 and 40, hypotenuse = → **E**

legs 21 and 72, hypotenuse = → **F**

legs 9 and 12, hypotenuse = → **V**

legs 60 and 63, hypotenuse = → **O**

legs 27 and 120, hypotenuse = → **D**

legs 12 and 35, hypotenuse = → **C**

legs 5 and 12, hypotenuse = → **N**

legs 40 and 75, hypotenuse = → **M**

legs 15 and 20, hypotenuse = → **I**

legs 15 and 36, hypotenuse = → **L**

legs 8 and 15, hypotenuse = → **H**

legs 20 and 48, hypotenuse = → **T**

legs 25 and 60, hypotenuse = → **S**

Scratch space:

CLUE 5**Fractions of a number - the last clue**

A spilled container left a puddle on the floor. If we calculate the exact fraction of the liquid that evaporated, we can determine how long ago they fled.

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:

$1/6 \text{ of } 42 = \boxed{}$

$8/10 \text{ of } 10 = \boxed{}$

$2/3 \text{ of } 15 = \boxed{}$

$1/2 \text{ of } 2 = \boxed{}$

$1/8 \text{ of } 16 = \boxed{}$

$1/6 \text{ of } 18 = \boxed{}$

$8/10 \text{ of } 15 = \boxed{}$

$4/5 \text{ of } 5 = \boxed{}$

$1/5 \text{ of } 55 = \boxed{}$

$1/3 \text{ of } 15 = \boxed{}$

$4/8 \text{ of } 18 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain cracked the seal with a wrench, then corrupted the grid with glitch serum.
2. The villain leaped away using pump boots, then corrupted the grid with glitch serum.
3. The villain filtered the liquid through a mask, then corrupted the grid with glitch serum.
4. The villain cracked the seal with a wrench, then escaped with neon elixir.
5. The villain cracked the seal with a wrench, then drained the solar fuel tank.
6. The villain filtered the liquid through a mask, then loaded up the heavy water.
7. The villain siphoned the prime reservoir, then loaded up the heavy water.
8. The villain filled the giant beaker, then corrupted the grid with glitch serum.
9. The villain filled the giant beaker, then escaped with neon elixir.
10. The villain leaped away using pump boots, then escaped with neon elixir.
11. The villain filled the giant beaker, then loaded up the heavy water.
12. The villain siphoned the prime reservoir, then escaped with neon elixir.

Answer Key

The Great Capacity Caper

Culprit: Lord Kelvin

Funnel Mask · Heavy Water · No Goggles · Chrome Silver Hair · Absorbent Sponge

Trail: Start 21 → Clue 1 15 → Clue 2 8 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE THIEF DID NOT STEAL THE MAGNA JUICE"

$\frac{6}{8}$ of 24 = 18 (T) · $\frac{1}{3}$ of 159 = 53 (C) · $\frac{6}{8}$ of 68 = 51 (H) · $\frac{1}{3}$ of 75 = 25 (G) · $\frac{3}{5}$ of 35 = 21 (D) · $\frac{8}{10}$ of 40 = 32 (A) · $\frac{2}{5}$ of 110 = 44 (U) · $\frac{4}{8}$ of 110 = 55 (S) · $\frac{1}{6}$ of 12 = 2 (I) · $\frac{2}{6}$ of 51 = 17 (J) · $\frac{2}{4}$ of 118 = 59 (L) · $\frac{1}{3}$ of 93 = 31 (E) · $\frac{3}{8}$ of 8 = 3 (M) · $\frac{2}{3}$ of 45 = 30 (N) · $\frac{1}{2}$ of 86 = 43 (F) · $\frac{2}{4}$ of 94 = 47 (O)

Clue 2 (Multiplication facts (1-12)): "NO GOGGLE STRAP MARKS WERE LEFT BEHIND"

$9 \times 2 = 18$ (N) · $11 \times 9 = 99$ (I) · $5 \times 3 = 15$ (D) · $5 \times 5 = 25$ (G) · $2 \times 10 = 20$ (S) · $7 \times 9 = 63$ (H) · $3 \times 8 = 24$ (P) · $6 \times 9 = 54$ (E) · $2 \times 7 = 14$ (W) · $9 \times 5 = 45$ (A) · $10 \times 8 = 80$ (B) · $7 \times 3 = 21$ (F) · $8 \times 12 = 96$ (O) · $2 \times 1 = 2$ (T) · $12 \times 9 = 108$ (L) · $1 \times 8 = 8$ (R) · $1 \times 1 = 1$ (K) · $6 \times 8 = 48$ (M)

Clue 3 (Rounding): "THE THIEF RAN FROM A WET SPONGE"

Round 1,689 to the nearest hundred = 1700 (T) · Round 1,619 to the nearest thousand = 2000 (P) · Round 291 to the nearest ten = 290 (O) · Round 2,931 to the nearest thousand = 3000 (F) · Round 367 to the nearest ten = 370 (N) · Round 48 to the nearest ten = 50 (A) · Round 18 to the nearest ten = 20 (G) · Round 114 to the nearest ten = 110 (H) · Round 2,852 to the nearest hundred = 2900 (M) · Round 865 to the nearest hundred = 900 (E) · Round 163 to the nearest hundred = 200 (I) · Round 434 to the nearest ten = 430 (R) · Round 500 to the nearest hundred = 500 (W) · Round 26 to the nearest ten = 30 (S)

Clue 4 (Pythagorean theorem): "A CHROME SILVER STRAND WAS ON THE FLOOR"

legs 18 and 24, hypotenuse = 30 (A) · legs 16 and 30, hypotenuse = 34 (W) · legs 6 and 8, hypotenuse = 10 (R) · legs 9 and 40, hypotenuse = 41 (E) · legs 21 and 72, hypotenuse = 75 (F) · legs 9 and 12, hypotenuse = 15 (V) · legs 60 and 63, hypotenuse = 87 (O) · legs 27 and 120, hypotenuse = 123 (D) · legs 12 and 35, hypotenuse = 37 (C) · legs 5 and 12, hypotenuse = 13 (N) · legs 40 and 75, hypotenuse = 85 (M) · legs 15 and 20, hypotenuse = 25 (I) · legs 15 and 36, hypotenuse = 39 (L) · legs 8 and 15, hypotenuse = 17 (H) · legs 20 and 48, hypotenuse = 52 (T) · legs 25 and 60, hypotenuse = 65 (S)

Clue 5 (Fractions of a number): surviving statement is box 6 → Lord Kelvin

$\frac{1}{6}$ of 42 = 7 · $\frac{8}{10}$ of 10 = 8 · $\frac{2}{3}$ of 15 = 10 · $\frac{1}{2}$ of 2 = 1 · $\frac{1}{8}$ of 16 = 2 · $\frac{1}{6}$ of 18 = 3 · $\frac{8}{10}$ of 15 = 12 · $\frac{4}{5}$ of 5 = 4 · $\frac{1}{5}$ of 55 = 11 · $\frac{1}{3}$ of 15 = 5 · $\frac{4}{8}$ of 18 = 9