The Mystery of the Broken Nether Star

Grade 8 math · Multiplication, Exponents, Square roots, Pythagorean theorem, Two-step equations · Reading level grades 7-9

Detective: _____ **Date:** _____

Someone shattered the central beacon on the Blocktopia SMP server and stole the Nether Star. Work through the math clues to narrow down the suspects and expose the Griefing Phantom.

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 Griefing Phantom is _____

Possible suspects

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

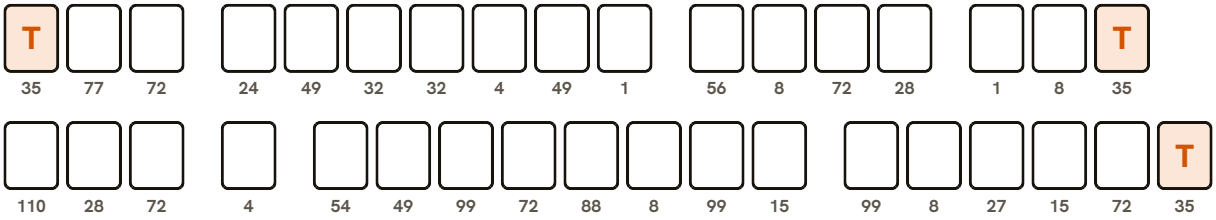
NAME	ENCHANTMENT	OFFHAND ITEM	DOMINANT HAND	HELMET COLOR	TRAP TYPE
PortalPauly	Blast Protection	Firework Rocket	Left Handed	Diamond Blue	Lava Pit
BlockyBob	Feather Falling	Golden Apple	Left Handed	Netherite Gray	Piston Wall
EnderEmma	Fire Aspect	Ender Pearl	Right Handed	Netherite Gray	Piston Wall
IronIan	Blast Protection	Golden Apple	Left Handed	Netherite Gray	Tnt Trap
BlazeBella	Feather Falling	Shield	Right Handed	Netherite Gray	Tnt Trap
SteveCraft	Fire Aspect	Ender Pearl	Left Handed	Diamond Blue	Piston Wall
MinerMike	Fire Aspect	Firework Rocket	Right Handed	Obsidian Black	Piston Wall
DiamondDan	Silk Touch	Totem of Undying	Left Handed	Netherite Gray	Piston Wall
WitherWill	Swift Sneak	Golden Apple	Right Handed	Netherite Gray	Piston Wall
QuartzQuinn	Silk Touch	Golden Apple	Left Handed	Netherite Gray	Piston Wall
NetherNick	Blast Protection	Ender Pearl	Left Handed	Netherite Gray	Lava Pit
StoneSam	Feather Falling	Ender Pearl	Left Handed	Diamond Blue	Lava Pit
GoldieGabe	Fire Aspect	Totem of Undying	Right Handed	Netherite Gray	Piston Wall
AnvilAndy	Fire Aspect	Golden Apple	Right Handed	Netherite Gray	Piston Wall
TorchTori	Silk Touch	Firework Rocket	Right Handed	Netherite Gray	Tnt Trap
AlexBlock	Silk Touch	Golden Apple	Left Handed	Obsidian Black	Piston Wall
RedstoneRita	Feather Falling	Shield	Left Handed	Netherite Gray	Piston Wall
RubyRaven	Feather Falling	Firework Rocket	Left Handed	Diamond Blue	Lava Pit
VoxelVal	Fire Aspect	Totem of Undying	Right Handed	Netherite Gray	Tnt Trap
CobbleCody	Fire Aspect	Ender Pearl	Right Handed	Netherite Gray	Lava Pit
PixelPete	Blast Protection	Firework Rocket	Left Handed	Netherite Gray	Piston Wall

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CLUE 1 Multiplication facts (1-12)

> To count the rows of stolen obsidian blocks stacked in the hidden warehouse, you tally the inventory grids.

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



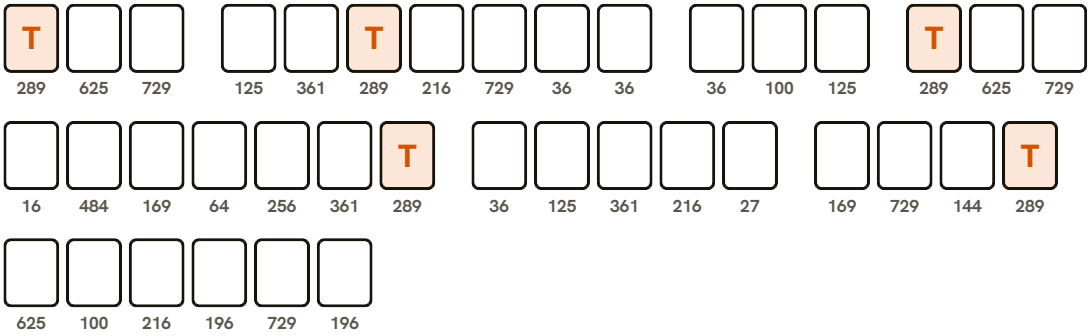
5 × 7 = ☐ → T	7 × 7 = ☐ → I	9 × 6 = ☐ → F	3 × 9 = ☐ → C
4 × 7 = ☐ → S	11 × 8 = ☐ → W	12 × 2 = ☐ → V	
9 × 11 = ☐ → R	4 × 8 = ☐ → L	2 × 4 = ☐ → O	8 × 7 = ☐ → D
1 × 1 = ☐ → N	3 × 5 = ☐ → K	10 × 11 = ☐ → U	
9 × 8 = ☐ → E	11 × 7 = ☐ → H	4 × 1 = ☐ → A	

Scratch space:

CLUE 2 Exponents

> The power levels of the server grid grow exponentially with every boosted redstone repeater you inspect.

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



17^2 = ☐ → T

12^2 = ☐ → F

19^2 = ☐ → I

9^3 = ☐ → E

4^3 = ☐ → P

5^3 = ☐ → W

2^8 = ☐ → R

3^3 = ☐ → G

6^2 = ☐ → S

13^2 = ☐ → L

22^2 = ☐ → U

10^2 = ☐ → A

5^4 = ☐ → H

14^2 = ☐ → D

4^2 = ☐ → C

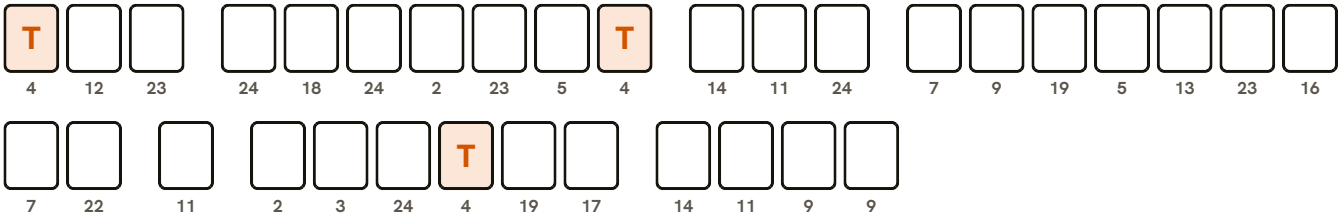
6^3 = ☐ → N

Scratch space:

CLUE 3 Square roots

> Calculating the exact side length of the square zone around the griefed temple requires taking a square root.

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



sqrt(16) = ☐ → T

sqrt(324) = ☐ → U

sqrt(576) = ☐ → S

sqrt(49) = ☐ → B

sqrt(529) = ☐ → E

sqrt(484) = ☐ → Y

sqrt(81) = ☐ → L

sqrt(9) = ☐ → I

sqrt(25) = ☐ → C

sqrt(144) = ☐ → H

sqrt(196) = ☐ → W

sqrt(169) = ☐ → K

sqrt(4) = ☐ → P

sqrt(256) = ☐ → D

sqrt(121) = ☐ → A

sqrt(361) = ☐ → O

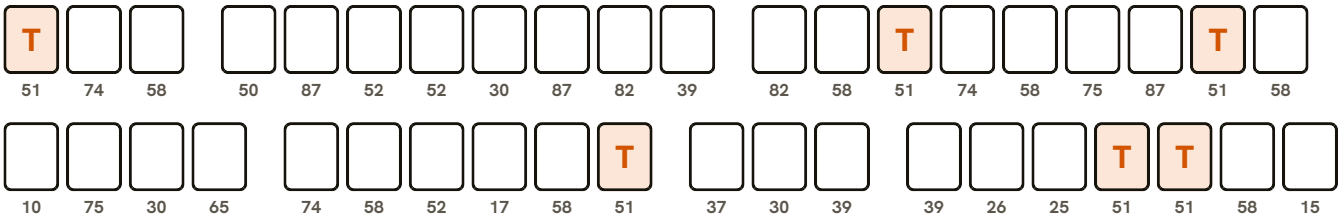
sqrt(289) = ☐ → N

Scratch space:

CLUE 4 Pythagorean theorem

> To find the shortest diagonal line across the blocky landscape from the crime scene to the secret base, you measure the right triangle.

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



legs 24 and 45, hypotenuse = ☐ → T

legs 7 and 24, hypotenuse = ☐ → O

legs 40 and 42, hypotenuse = ☐ → E

legs 25 and 60, hypotenuse = ☐ → Y

legs 14 and 48, hypotenuse = ☐ → V

legs 24 and 70, hypotenuse = ☐ → H

legs 20 and 48, hypotenuse = ☐ → L

legs 6 and 8, hypotenuse = ☐ → G

legs 18 and 24, hypotenuse = ☐ → A

legs 15 and 36, hypotenuse = ☐ → S

legs 18 and 80, hypotenuse = ☐ → N

legs 8 and 15, hypotenuse = ☐ → M

legs 12 and 35, hypotenuse = ☐ → W

legs 21 and 72, hypotenuse = ☐ → R

legs 9 and 12, hypotenuse = ☐ → D

legs 60 and 63, hypotenuse = ☐ → I

legs 10 and 24, hypotenuse = ☐ → P

Scratch space:

CLUE 5 Two-step equations - the last clue

Unlocking the hidden vault door requires solving for the missing redstone signal variable in a two-step equation.

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:

$4x + 4 = 32$, x = ☐	$2x + 5 = 17$, x = ☐	$4x + 7 = 15$, x = ☐	$5x + 1 = 56$, x = ☐
$2x + 6 = 16$, x = ☐	$3x + 1 = 28$, x = ☐	$5x + 11 = 51$, x = ☐	$4x + 2 = 6$, x = ☐
$2x + 5 = 29$, x = ☐	$4x + 3 = 43$, x = ☐	$6x + 12 = 36$, x = ☐	

Step 2 - cross out the sentence with each answer:

1. The villain snuck past guards with swift sneak, then ate a glowing golden apple.
2. The villain landed safely with feather falling, then ate a glowing golden apple.
3. The villain mined the beacon with silk touch, then popped a totem of undying.
4. The villain absorbed the explosion with blast protection, then popped a totem of undying.
5. The villain cast fire aspect on the chest, then ate a glowing golden apple.
6. The villain landed safely with feather falling, then blocked with a heavy shield.
7. The villain mined the beacon with silk touch, then ate a glowing golden apple.
8. The villain snuck past guards with swift sneak, then boosted away with a firework rocket.
9. The villain snuck past guards with swift sneak, then blocked with a heavy shield.
10. The villain cast fire aspect on the chest, then boosted away with a firework rocket.
11. The villain mined the beacon with silk touch, then blocked with a heavy shield.
12. The villain snuck past guards with swift sneak, then escaped using an ender pearl.

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TEACHER / PARENT

Answer Key

The Mystery of the Broken Nether Star

Culprit: DiamondDan

Silk Touch · Totem of Undying · Left Handed · Netherite Gray · Piston Wall

Trail: Start 21 → Clue 1 16 → Clue 2 9 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Multiplication facts (1-12)): "THE VILLAIN DOES NOT USE A FIREWORK ROCKET"

5 × 7 = 35 (T) · 7 × 7 = 49 (I) · 9 × 6 = 54 (F) · 3 × 9 = 27 (C) · 4 × 7 = 28 (S) · 11 × 8 = 88 (W) · 12 × 2 = 24 (V) · 9 × 11 = 99 (R) · 4 × 8 = 32 (L) · 2 × 4 = 8 (O) · 8 × 7 = 56 (D) · 1 × 1 = 1 (N) · 3 × 5 = 15 (K) · 10 × 11 = 110 (U) · 9 × 8 = 72 (E) · 11 × 7 = 77 (H) · 4 × 1 = 4 (A)

Clue 2 (Exponents): "THE WITNESS SAW THE CULPRIT SWING LEFT HANDED"

17^2 = 289 (T) · 12^2 = 144 (F) · 19^2 = 361 (I) · 9^3 = 729 (E) · 4^3 = 64 (P) · 5^3 = 125 (W) · 2^8 = 256 (R) · 3^3 = 27 (G) · 6^2 = 36 (S) · 13^2 = 169 (L) · 22^2 = 484 (U) · 10^2 = 100 (A) · 5^4 = 625 (H) · 14^2 = 196 (D) · 4^2 = 16 (C) · 6^3 = 216 (N)

Clue 3 (Square roots): "THE SUSPECT WAS BLOCKED BY A PISTON WALL"

sqrt(16) = 4 (T) · sqrt(324) = 18 (U) · sqrt(576) = 24 (S) · sqrt(49) = 7 (B) · sqrt(529) = 23 (E) · sqrt(484) = 22 (Y) · sqrt(81) = 9 (L) · sqrt(9) = 3 (I) · sqrt(25) = 5 (C) · sqrt(144) = 12 (H) · sqrt(196) = 14 (W) · sqrt(169) = 13 (K) · sqrt(4) = 2 (P) · sqrt(256) = 16 (D) · sqrt(121) = 11 (A) · sqrt(361) = 19 (O) · sqrt(289) = 17 (N)

Clue 4 (Pythagorean theorem): "THE VILLAINS NETHERITE GRAY HELMET WAS SPOTTED"

legs 24 and 45, hypotenuse = 51 (T) · legs 7 and 24, hypotenuse = 25 (O) · legs 40 and 42, hypotenuse = 58 (E) · legs 25 and 60, hypotenuse = 65 (Y) · legs 14 and 48, hypotenuse = 50 (V) · legs 24 and 70, hypotenuse = 74 (H) · legs 20 and 48, hypotenuse = 52 (L) · legs 6 and 8, hypotenuse = 10 (G) · legs 18 and 24, hypotenuse = 30 (A) · legs 15 and 36, hypotenuse = 39 (S) · legs 18 and 80, hypotenuse = 82 (N) · legs 8 and 15, hypotenuse = 17 (M) · legs 12 and 35, hypotenuse = 37 (W) · legs 21 and 72, hypotenuse = 75 (R) · legs 9 and 12, hypotenuse = 15 (D) · legs 60 and 63, hypotenuse = 87 (I) · legs 10 and 24, hypotenuse = 26 (P)

Clue 5 (Two-step equations): surviving statement is box 3 → DiamondDan

4x + 4 = 32, x = 7 · 2x + 5 = 17, x = 6 · 4x + 7 = 15, x = 2 · 5x + 1 = 56, x = 11 · 2x + 6 = 16, x = 5 · 3x + 1 = 28, x = 9 · 5x + 11 = 51, x = 8 · 4x + 2 = 6, x = 1 · 2x + 5 = 29, x = 12 · 4x + 3 = 43, x = 10 · 6x + 12 = 36, x = 4