



# The All-Star Trophy Heist

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

Detective: \_\_\_\_\_ Date: \_\_\_\_\_

The golden championship trophy has vanished from the arena vault right before the big game! The Sneaker Saboteur broke past security, leaving nothing but scuffed court lines and a deflated game ball. Detective, we must analyze the clues and catch the thief before tip-off!

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 The Sneaker Saboteur is** \_\_\_\_\_

# Possible suspects

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

| NAME                  | SIGNATURE MOVE    | SHOE TECH             | SHOOTING HAND        | SWEATBAND COLOR | VULNERABILITY        |
|-----------------------|-------------------|-----------------------|----------------------|-----------------|----------------------|
| Jimmy Butler          | Fadeaway Jumper   | High-Top Ankle Straps | Right-Handed Shooter | Blue Sweatband  | Loud Crowd Noise     |
| Jayson Tatum          | Eurostep          | Spring-Loaded Soles   | Right-Handed Shooter | Red Sweatband   | Loud Crowd Noise     |
| Chris Paul            | Crossover Dribble | Neon Glow Laces       | Right-Handed Shooter | Red Sweatband   | Squeaky Court Floors |
| Joel Embiid           | Crossover Dribble | Neon Glow Laces       | Right-Handed Shooter | Green Sweatband | Loud Crowd Noise     |
| Anthony Davis         | Fadeaway Jumper   | Sticky Grip Outsoles  | Right-Handed Shooter | Green Sweatband | Loud Crowd Noise     |
| Bam Adebayo           | Eurostep          | Neon Glow Laces       | Left-Handed Shooter  | Green Sweatband | Loud Crowd Noise     |
| Nikola Jokic          | Stepback Three    | Sticky Grip Outsoles  | Right-Handed Shooter | Green Sweatband | Loud Crowd Noise     |
| Kyrie Irving          | Stepback Three    | High-Top Ankle Straps | Right-Handed Shooter | Green Sweatband | Double-Team Pressure |
| Damian Lillard        | Crossover Dribble | Spring-Loaded Soles   | Left-Handed Shooter  | Red Sweatband   | Squeaky Court Floors |
| Devin Booker          | Skyhook           | Sticky Grip Outsoles  | Right-Handed Shooter | Red Sweatband   | Squeaky Court Floors |
| DeAaron Fox           | Crossover Dribble | Neon Glow Laces       | Left-Handed Shooter  | Green Sweatband | Loud Crowd Noise     |
| Kevin Durant          | Skyhook           | Sticky Grip Outsoles  | Left-Handed Shooter  | Red Sweatband   | Double-Team Pressure |
| Luka Doncic           | Eurostep          | Sticky Grip Outsoles  | Right-Handed Shooter | Blue Sweatband  | Double-Team Pressure |
| Kawhi Leonard         | Stepback Three    | Sticky Grip Outsoles  | Right-Handed Shooter | Red Sweatband   | Loud Crowd Noise     |
| Trae Young            | Fadeaway Jumper   | High-Top Ankle Straps | Left-Handed Shooter  | Green Sweatband | Double-Team Pressure |
| Stephen Curry         | Skyhook           | Neon Glow Laces       | Right-Handed Shooter | Blue Sweatband  | Loud Crowd Noise     |
| Ja Morant             | Eurostep          | High-Top Ankle Straps | Right-Handed Shooter | Green Sweatband | Loud Crowd Noise     |
| Draymond Green        | Stepback Three    | Spring-Loaded Soles   | Right-Handed Shooter | Green Sweatband | Loud Crowd Noise     |
| Paul George           | Crossover Dribble | Spring-Loaded Soles   | Right-Handed Shooter | Red Sweatband   | Double-Team Pressure |
| Giannis Antetokounmpo | Crossover Dribble | Neon Glow Laces       | Left-Handed Shooter  | Blue Sweatband  | Loud Crowd Noise     |
| Russell Westbrook     | Eurostep          | Sticky Grip Outsoles  | Right-Handed Shooter | Green Sweatband | Squeaky Court Floors |

## CLUE 1 Exponents

To unlock the encrypted security keypad on the vault door, you must solve a sequence where the system's passcode options grow exponentially.

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |   |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| T   |     |     |     |     |     |     |     |     | T   |     |     |     |     |     |     |     | T |
| 400 | 625 | 256 | 144 | 128 | 144 | 100 | 256 | 343 | 400 | 361 | 81  | 256 | 144 | 32  | 81  | 400 |   |
|     |     |     |     |     |     |     |     | T   |     |     |     | T   |     |     |     |     |   |
| 512 | 256 | 289 | 49  | 625 | 64  | 484 | 625 | 400 | 81  | 100 | 144 | 400 | 49  | 289 | 100 | 144 |   |

|                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| $20^2 = \square \rightarrow$ T | $2^7 = \square \rightarrow$ U  | $16^2 = \square \rightarrow$ E | $8^3 = \square \rightarrow$ W  |
| $22^2 = \square \rightarrow$ G | $7^3 = \square \rightarrow$ C  | $2^5 = \square \rightarrow$ N  | $19^2 = \square \rightarrow$ D |
| $3^4 = \square \rightarrow$ O  | $17^2 = \square \rightarrow$ A | $7^2 = \square \rightarrow$ R  | $5^4 = \square \rightarrow$ H  |
| $12^2 = \square \rightarrow$ S | $10^2 = \square \rightarrow$ P | $8^2 = \square \rightarrow$ I  |                                |

Scratch space:

## CLUE 2

The arena security footage is split into perfect squares, meaning you must calculate the square root of the grid areas to find the active camera angle.

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

The diagram consists of two rows of boxes. The top row has 19 boxes in total, with the 1st, 13th, and 17th boxes containing a red 'R'. The numbers below the top row are: 12, 21, 5, 11, 8, 11, 22, 7, 17, 23, 17, 11, 2, 2, 10, 19, 22, 12, 16, 15. The bottom row has 14 boxes in total, with the 3rd box containing a red 'R'. The numbers below the bottom row are: 18, 23, 12, 23, 2, 7, 8, 11, 23, 4, 22, 6, 6.

sqrt(144) =  → **R**

sqrt(49) =  → **N**

sqrt(64) =  → **T**

sqrt(441) =  →

sqrt(529) =  → **E**

sqrt(256) =  → **K**

sqrt(36) =  → **L**

sqrt(324) =  → **W**

sqrt(16) =  → **B**

sqrt(4) =  → ☒ 0

sqrt(25) =  → **G**

sqrt(361) =  → **M**

sqrt(100) =  → **P**

sqrt(121) =  → **H**

sqrt(484) =  → **A**

$\text{sqrt}(289) = \square \rightarrow \boxed{\text{D}}$

sqrt(225) =  → **S**

Scratch space:

## CLUE 3

## Pythagorean theorem

The thief escaped by running diagonally across the court floor, and you can calculate their exact speed using the Pythagorean theorem.

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

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| L  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 65 | 25 | 13 | 40 | 50 | 17 | 25 | 34 | 40 | 26 | 25 | 75 | 58 | 52 |    |    |    |    |
|    |    |    |    | L  | L  |    |    |    |    |    |    |    |    |    |    |    |    |
| 85 | 25 | 85 | 5  | 65 | 65 | 39 | 17 | 13 | 75 | 26 | 52 | 40 | 85 | 29 | 52 | 75 | 17 |
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 58 | 29 | 25 | 85 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

legs 25 and 60, hypotenuse =  → **L**

legs 21 and 72, hypotenuse =  → **I**

legs 20 and 21, hypotenuse =  → **H**

legs 16 and 30, hypotenuse =  → **W**

legs 40 and 75, hypotenuse =  → **T**

legs 15 and 36, hypotenuse =  → **Y**

legs 8 and 15, hypotenuse =  → **R**

legs 20 and 48, hypotenuse =  → **E**

legs 40 and 42, hypotenuse =  → **S**

legs 24 and 32, hypotenuse =  → **D**

legs 7 and 24, hypotenuse =  → **O**

legs 3 and 4, hypotenuse =  → **A**

legs 14 and 48, hypotenuse =  → **C**

legs 5 and 12, hypotenuse =  → **U**

legs 10 and 24, hypotenuse =  → **N**

Scratch space:

## Order of operations

Analyzing the scrambled digital stats log requires using the strict mathematical order of operations to reveal the suspect's court time.

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

71 76 70 70 18 22 106 8 76 16 100 110 106 27

27 18 106 71 71 70 6 90 18 17 114 70 6 16 27 77 41 106 12

$$35 + 6 \times 6 = \boxed{\phantom{00}} \rightarrow \mathbf{G}$$

$$3 + 7 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{T}}$$

$$6 + 3 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{Y}}$$

$$17 + 4 \times 6 = \boxed{\phantom{00}} \rightarrow \boxed{\text{L}}$$

$$7 + 3 \times 3 = \boxed{\phantom{00}} \rightarrow \boxed{\phantom{00}}$$

$$3 + 3 \times 8 = \boxed{\phantom{000}} \rightarrow \boxed{\text{S}}$$

$$6 + 8 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{F}}$$

$$8 \times 11 - 18 = \boxed{\phantom{00}} \rightarrow \boxed{\text{E}}$$

$$82 + 4 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{0}$$

$$3 \times 11 - 27 = \boxed{\phantom{00}} \rightarrow \boxed{\text{D}}$$

$$4 + 2 \times 7 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{N}}$$

$$2 + 2 \times 3 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{B}}$$

$$70 + 6 \times 5 = \boxed{\phantom{000}} \rightarrow \boxed{\text{C}}$$

$$82 + 3 \times 8 = \boxed{\phantom{000}} \rightarrow \boxed{\mathbf{A}}$$

$$44 + 8 \times 4 = \boxed{\phantom{00}} \rightarrow \boxed{\text{R}}$$

$$11 \times 8 - 11 = \boxed{\phantom{00}} \rightarrow \boxed{\text{P}}$$

$$11 \times 12 - 18 = \boxed{\phantom{000}} \rightarrow \boxed{\text{H}}$$

$$10 \times 12 - 10 = \boxed{\phantom{000}} \rightarrow \boxed{\text{W}}$$

Scratch space:

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

The suspect left a mysterious practice schedule, and you must solve a two-step algebraic equation to find their total target score.

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:**

$4x + 4 = 36, x = \boxed{\phantom{00}}$

$4x + 2 = 42, x = \boxed{\phantom{00}}$

$4x + 3 = 51, x = \boxed{\phantom{00}}$

$3x + 11 = 32, x = \boxed{\phantom{00}}$

$2x + 12 = 34, x = \boxed{\phantom{00}}$

$4x + 12 = 48, x = \boxed{\phantom{00}}$

$2x + 11 = 19, x = \boxed{\phantom{00}}$

$6x + 10 = 46, x = \boxed{\phantom{00}}$

$5x + 12 = 22, x = \boxed{\phantom{00}}$

$2x + 11 = 21, x = \boxed{\phantom{00}}$

$3x + 8 = 11, x = \boxed{\phantom{00}}$

**Step 2 - cross out the sentence with each answer:**

1. The villain slices through the lane with a eurostep, then leaves dusty tread marks from sticky grip outsoles.
2. The villain steps back for a deep three-pointer, then flashes neon glow laces in the dark locker room.
3. The villain shakes the defender with a crossover, then flashes neon glow laces in the dark locker room.
4. The villain slices through the lane with a eurostep, then flashes neon glow laces in the dark locker room.
5. The villain fades away for a baseline jumper, then cushions the heavy landing with shock-absorbing gel.
6. The villain lofts a high skyhook over the defense, then leaves dusty tread marks from sticky grip outsoles.
7. The villain fades away for a baseline jumper, then leaps incredibly high using spring-loaded soles.
8. The villain fades away for a baseline jumper, then leaves dusty tread marks from sticky grip outsoles.
9. The villain slices through the lane with a eurostep, then adjusts tight high-top ankle straps before escaping.
10. The villain steps back for a deep three-pointer, then leaps incredibly high using spring-loaded soles.
11. The villain steps back for a deep three-pointer, then adjusts tight high-top ankle straps before escaping.
12. The villain steps back for a deep three-pointer, then leaves dusty tread marks from sticky grip outsoles.

# Answer Key

## The All-Star Trophy Heist

### Culprit: Joel Embiid

Crossover Dribble · Neon Glow Laces · Right-Handed Shooter · Green Sweatband · Loud Crowd Noise

Trail: Start 21 → Clue 1 17 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

#### Clue 1 (Exponents): "THE SUSPECT DOES NOT WEAR HIGH TOP STRAPS"

$20^2 = 400$  (T) ·  $2^7 = 128$  (U) ·  $16^2 = 256$  (E) ·  $8^3 = 512$  (W) ·  $22^2 = 484$  (G) ·  $7^3 = 343$  (C) ·  $2^5 = 32$  (N) ·  $19^2 = 361$  (D) ·  $3^4 = 81$  (O) ·  $17^2 = 289$  (A) ·  $7^2 = 49$  (R) ·  $5^4 = 625$  (H) ·  $12^2 = 144$  (S) ·  $10^2 = 100$  (P) ·  $8^2 = 64$  (I)

#### Clue 2 (Square roots): "RIGHT HANDED HOOP MARKS WERE ON THE BALL"

$\sqrt{144} = 12$  (R) ·  $\sqrt{49} = 7$  (N) ·  $\sqrt{64} = 8$  (T) ·  $\sqrt{441} = 21$  (I) ·  $\sqrt{529} = 23$  (E) ·  $\sqrt{256} = 16$  (K) ·  $\sqrt{36} = 6$  (L) ·  $\sqrt{324} = 18$  (W) ·  $\sqrt{16} = 4$  (B) ·  $\sqrt{4} = 2$  (O) ·  $\sqrt{25} = 5$  (G) ·  $\sqrt{361} = 19$  (M) ·  $\sqrt{100} = 10$  (P) ·  $\sqrt{121} = 11$  (H) ·  $\sqrt{484} = 22$  (A) ·  $\sqrt{289} = 17$  (D) ·  $\sqrt{225} = 15$  (S)

#### Clue 3 (Pythagorean theorem): "LOUD CROWD NOISE TOTALLY RUINED THEIR SHOT"

legs 25 and 60, hypotenuse = 65 (L) · legs 21 and 72, hypotenuse = 75 (I) · legs 20 and 21, hypotenuse = 29 (H) · legs 16 and 30, hypotenuse = 34 (W) · legs 40 and 75, hypotenuse = 85 (T) · legs 15 and 36, hypotenuse = 39 (Y) · legs 8 and 15, hypotenuse = 17 (R) · legs 20 and 48, hypotenuse = 52 (E) · legs 40 and 42, hypotenuse = 58 (S) · legs 24 and 32, hypotenuse = 40 (D) · legs 7 and 24, hypotenuse = 25 (O) · legs 3 and 4, hypotenuse = 5 (A) · legs 14 and 48, hypotenuse = 50 (C) · legs 5 and 12, hypotenuse = 13 (U) · legs 10 and 24, hypotenuse = 26 (N)

#### Clue 4 (Order of operations): "GREEN FABRIC WAS SNAGGED ON THE DISPLAY"

$35 + 6 \times 6 = 71$  (G) ·  $3 + 7 \times 2 = 17$  (T) ·  $6 + 3 \times 2 = 12$  (Y) ·  $17 + 4 \times 6 = 41$  (L) ·  $7 + 3 \times 3 = 16$  (I) ·  $3 + 3 \times 8 = 27$  (S) ·  $6 + 8 \times 2 = 22$  (F) ·  $8 \times 11 - 18 = 70$  (E) ·  $82 + 4 \times 2 = 90$  (O) ·  $3 \times 11 - 27 = 6$  (D) ·  $4 + 2 \times 7 = 18$  (N) ·  $2 + 2 \times 3 = 8$  (B) ·  $70 + 6 \times 5 = 100$  (C) ·  $82 + 3 \times 8 = 106$  (A) ·  $44 + 8 \times 4 = 76$  (R) ·  $11 \times 8 - 11 = 77$  (P) ·  $11 \times 12 - 18 = 114$  (H) ·  $10 \times 12 - 10 = 110$  (W)

#### Clue 5 (Two-step equations): surviving statement is box 3 → Joel Embiid

$4x + 4 = 36, x = 8$  ·  $4x + 2 = 42, x = 10$  ·  $4x + 3 = 51, x = 12$  ·  $3x + 11 = 32, x = 7$  ·  $2x + 12 = 34, x = 11$  ·  $4x + 12 = 48, x = 9$  ·  $2x + 11 = 19, x = 4$  ·  $6x + 10 = 46, x = 6$  ·  $5x + 12 = 22, x = 2$  ·  $2x + 11 = 21, x = 5$  ·  $3x + 8 = 11, x = 1$