



The Bassline Heist

Grade 9 math · Two-step equations, Exponents, Square roots, Integers · Reading level grades 7-9

Detective: _____ Date: _____

The golden baton of the Maestro has vanished right before the opening night performance. Only a skilled bass player with access to the orchestra pit could have bypassed the security locks and pulled off this musical heist.

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 bassist is _____

Possible suspects

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

NAME	PRIMARY INSTRUMENT	SECONDARY SKILL	PHYSICAL HABIT	STAGE HAIRSTYLE	SONIC DISLIKE
Renaud Garcia Fons	electric upright	harpsichord tuning	taps right foot	tight ponytail	high pitch whistles
Giovanni Bottesini	slap bass	bow rehairing	taps right foot	messy bun	high pitch whistles
Ray Brown	five string bass	bridge adjusting	taps left foot	messy bun	drastic tempo changes
Stanley Clarke	slap bass	rosin making	taps right foot	slicked back	drastic tempo changes
John Patitucci	electric upright	bridge adjusting	taps right foot	messy bun	high pitch whistles
Francois Rabbath	orchestral double bass	rosin making	taps left foot	messy bun	drastic tempo changes
Serge Koussevitzky	electric upright	rosin making	taps left foot	slicked back	high pitch whistles
Dave Holland	slap bass	bridge adjusting	taps right foot	tight ponytail	high pitch whistles
Paul Chambers	jazz acoustic	rosin making	taps right foot	slicked back	drastic tempo changes
Richard Davis	orchestral double bass	harpsichord tuning	taps left foot	messy bun	high pitch whistles
Esperanza Spalding	five string bass	rosin making	taps left foot	tight ponytail	drastic tempo changes
Charlie Haden	slap bass	rosin making	taps left foot	tight ponytail	drastic tempo changes
Edgar Meyer	five string bass	bridge adjusting	taps right foot	tight ponytail	drastic tempo changes
Scott LaFaro	five string bass	bow rehairing	taps left foot	messy bun	drastic tempo changes
Christian McBride	slap bass	harpsichord tuning	taps left foot	messy bun	drastic tempo changes
Gary Karr	jazz acoustic	harpsichord tuning	taps right foot	messy bun	drastic tempo changes
Ludwig Streicher	orchestral double bass	bridge adjusting	taps right foot	messy bun	drastic tempo changes
Marcus Miller	jazz acoustic	bridge adjusting	taps left foot	messy bun	high pitch whistles
Domenico Dragonetti	electric upright	sheet music copying	taps right foot	messy bun	drastic tempo changes
Charles Mingus	electric upright	harpsichord tuning	taps left foot	messy bun	drastic tempo changes
Victor Wooten	jazz acoustic	bow rehairing	taps right foot	tight ponytail	untuned piano keys

CLUE 1 Two-step equations

The head usher has a crate of concert programs. After handing out equal batches to three balconies and keeping twelve for the archive, sixty programs remain. Solve this equation to find the secret locker bin number.

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

4 2 19 8 10 8 3 19 12 4

6 19 2 16 20 6 14 11 18 8

$$4x + 5 = 21, x = \boxed{} \rightarrow \boxed{\text{T}}$$

$$6x + 2 = 98, x = \boxed{} \rightarrow \boxed{\text{A}}$$

$$4x + 7 = 63, x = \boxed{} \rightarrow \boxed{\mathbf{B}}$$

$$8x + 2 = 90, x = \boxed{} \rightarrow \boxed{0}$$

$$5x + 5 = 35, x = \boxed{} \rightarrow \boxed{\text{R}}$$

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

$$3x + 12 = 72, x = \boxed{} \rightarrow \boxed{} \mid$$

$$4x + 1 = 41, x = \boxed{} \rightarrow \boxed{\text{U}}$$

$6x + 3 = 81, x = \boxed{} \rightarrow \boxed{\text{N}}$

$$2x + 5 = 23, x = \boxed{} \rightarrow \boxed{\mathbf{D}}$$

$$7x + 11 = 95, x = \boxed{} \rightarrow \boxed{\text{C}}$$

$$6x + 8 = 116, x = \boxed{} \rightarrow \boxed{\mathbf{W}}$$

$$4x + 2 = 10, x = \boxed{} \rightarrow \boxed{\text{H}}$$

$$7x + 1 = 22, x = \boxed{} \rightarrow \boxed{\text{P}}$$

$$4x + 12 = 88, x = \boxed{} \rightarrow \boxed{\text{E}}$$

Scratch space:

CLUE 2 Exponents

The bass amplifier volume doubles with every extra level on the dial. To find the correct frequency channel on the receiver, calculate the power output when two is raised to the sixth power.

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

T 256	4	343	441	512	81	100	T 256	169	484	361	343	T 256	32	729	27	T 256	4	343
100	343	36	T 256	36	484	484	T 256											

$2^8 = \square \rightarrow \text{T}$	$21^2 = \square \rightarrow \text{G}$	$19^2 = \square \rightarrow \text{N}$	$2^9 = \square \rightarrow \text{U}$
$2^5 = \square \rightarrow \text{A}$	$22^2 = \square \rightarrow \text{O}$	$3^3 = \square \rightarrow \text{S}$	$3^6 = \square \rightarrow \text{P}$
$9^2 = \square \rightarrow \text{I}$	$13^2 = \square \rightarrow \text{Y}$	$7^3 = \square \rightarrow \text{E}$	$2^2 = \square \rightarrow \text{H}$
$6^2 = \square \rightarrow \text{F}$	$10^2 = \square \rightarrow \text{L}$		

Scratch space:

CLUE 3 Square roots

The percussion section is arranged in a perfect square grid on the center riser. The total area is one hundred forty-four square meters. Find the side length to unlock the equipment room gate.

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

H																			
4	10	13	18	19	24	8	10	19	13	15	17	13	18	9	14	5			

	H						
17	4	10	12	7	18	19	

$\sqrt{16} = \square \rightarrow$ H	$\sqrt{25} = \square \rightarrow$ O	$\sqrt{289} = \square \rightarrow$ C
$\sqrt{49} = \square \rightarrow$ G	$\sqrt{196} = \square \rightarrow$ P	$\sqrt{225} = \square \rightarrow$ I
$\sqrt{144} = \square \rightarrow$ N	$\sqrt{576} = \square \rightarrow$ D	$\sqrt{361} = \square \rightarrow$ S
$\sqrt{169} = \square \rightarrow$ T	$\sqrt{100} = \square \rightarrow$ A	$\sqrt{81} = \square \rightarrow$ M
$\sqrt{64} = \square \rightarrow$ R	$\sqrt{324} = \square \rightarrow$ E	

Scratch space:

CLUE 4 Integers

The tuning device tracks pitch changes in cents. The needle dropped twelve cents, rose fifteen, and then dropped five. Solve for the final integer value to read the digital readout.

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

A										A				A	
31	26	30	21	21	9	25	10	11	14	31	12	33	36	31	21
4	33	39	20	20	30	4									

$20 - (-11) = \square \rightarrow \text{A}$	$7 - (-4) = \square \rightarrow \text{N}$	$23 - (-10) = \square \rightarrow \text{R}$
$15 - (-15) = \square \rightarrow \text{E}$	$(-7) + 11 = \square \rightarrow \text{D}$	$(-12) + 32 = \square \rightarrow \text{P}$
$(-7) + 16 = \square \rightarrow \text{Y}$	$4 - (-10) = \square \rightarrow \text{H}$	$(-5) + 30 = \square \rightarrow \text{B}$
$(-2) + 23 = \square \rightarrow \text{S}$	$(-14) + 26 = \square \rightarrow \text{I}$	$(-13) + 52 = \square \rightarrow \text{O}$
$(-9) + 45 = \square \rightarrow \text{W}$	$(-11) + 37 = \square \rightarrow \text{M}$	$(-12) + 22 = \square \rightarrow \text{U}$

Scratch space:

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

The librarian needs to organize ninety music folders. She fills four large boxes and has ten folders left over. Solve for the capacity of each box to obtain the backstage entry code.

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:

$7x + 11 = 88, x = \boxed{}$

$7x + 1 = 36, x = \boxed{}$

$3x + 5 = 14, x = \boxed{}$

$9x + 8 = 89, x = \boxed{}$

$7x + 9 = 51, x = \boxed{}$

$8x + 2 = 18, x = \boxed{}$

$2x + 3 = 23, x = \boxed{}$

$8x + 10 = 106, x = \boxed{}$

$8x + 3 = 59, x = \boxed{}$

$9x + 7 = 79, x = \boxed{}$

$8x + 2 = 10, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain tunes the low E string, then scrambles the sheet music.
2. The villain hides behind the timpani, then swipes the golden baton.
3. The villain tunes the low E string, then swipes the golden baton.
4. The villain sneaks into the orchestra pit, then silences the metronome.
5. The villain unzips a padded instrument case, then mutes the conductor stand microphone.
6. The villain tunes the low E string, then unplugs the stage lights.
7. The villain unzips a padded instrument case, then swipes the golden baton.
8. The villain adjusts the bass amplifier, then mutes the conductor stand microphone.
9. The villain tunes the low E string, then mutes the conductor stand microphone.
10. The villain sneaks into the orchestra pit, then scrambles the sheet music.
11. The villain adjusts the bass amplifier, then swipes the golden baton.
12. The villain unzips a padded instrument case, then scrambles the sheet music.

Answer Key

The Bassline Heist

Culprit: Francois Rabbath

orchestral double bass · rosin making · taps left foot · messy bun · drastic tempo changes

Trail: Start 21 → Clue 1 18 → Clue 2 9 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Two-step equations): "THE SUSPECT DOES NOT REHAIR BOWS"

$4x + 5 = 21, x = 4$ (T) · $6x + 2 = 98, x = 16$ (A) · $4x + 7 = 63, x = 14$ (B) · $8x + 2 = 90, x = 11$ (O) · $5x + 5 = 35, x = 6$ (R) · $6x + 10 = 58, x = 8$ (S) · $3x + 12 = 72, x = 20$ (I) · $4x + 1 = 41, x = 10$ (U) · $6x + 3 = 81, x = 13$ (N) · $2x + 5 = 23, x = 9$ (D) · $7x + 11 = 95, x = 12$ (C) · $6x + 8 = 116, x = 18$ (W) · $4x + 2 = 10, x = 2$ (H) · $7x + 1 = 22, x = 3$ (P) · $4x + 12 = 88, x = 19$ (E)

Clue 2 (Exponents): "THE GUILTY ONE TAPS THE LEFT FOOT"

$2^8 = 256$ (T) · $21^2 = 441$ (G) · $19^2 = 361$ (N) · $2^9 = 512$ (U) · $2^5 = 32$ (A) · $22^2 = 484$ (O) · $3^3 = 27$ (S) · $3^6 = 729$ (P) · $9^2 = 81$ (I) · $13^2 = 169$ (Y) · $7^3 = 343$ (E) · $2^2 = 4$ (H) · $6^2 = 36$ (F) · $10^2 = 100$ (L)

Clue 3 (Square roots): "HATES DRASTIC TEMPO CHANGES"

$\sqrt{16} = 4$ (H) · $\sqrt{25} = 5$ (O) · $\sqrt{289} = 17$ (C) · $\sqrt{49} = 7$ (G) · $\sqrt{196} = 14$ (P) · $\sqrt{225} = 15$ (I) · $\sqrt{144} = 12$ (N) · $\sqrt{576} = 24$ (D) · $\sqrt{361} = 19$ (S) · $\sqrt{169} = 13$ (T) · $\sqrt{100} = 10$ (A) · $\sqrt{81} = 9$ (M) · $\sqrt{64} = 8$ (R) · $\sqrt{324} = 18$ (E)

Clue 4 (Integers): "A MESSY BUN HAIR WAS DROPPED"

$20 - (-11) = 31$ (A) · $7 - (-4) = 11$ (N) · $23 - (-10) = 33$ (R) · $15 - (-15) = 30$ (E) · $(-7) + 11 = 4$ (D) · $(-12) + 32 = 20$ (P) · $(-7) + 16 = 9$ (Y) · $4 - (-10) = 14$ (H) · $(-5) + 30 = 25$ (B) · $(-2) + 23 = 21$ (S) · $(-14) + 26 = 12$ (I) · $(-13) + 52 = 39$ (O) · $(-9) + 45 = 36$ (W) · $(-11) + 37 = 26$ (M) · $(-12) + 22 = 10$ (U)

Clue 5 (Two-step equations): surviving statement is box 4 → Francois Rabbath

$7x + 11 = 88, x = 11$ · $7x + 1 = 36, x = 5$ · $3x + 5 = 14, x = 3$ · $9x + 8 = 89, x = 9$ · $7x + 9 = 51, x = 6$ · $8x + 2 = 18, x = 2$ · $2x + 3 = 23, x = 10$ · $8x + 10 = 106, x = 12$ · $8x + 3 = 59, x = 7$ · $9x + 7 = 79, x = 8$ · $8x + 2 = 10, x = 1$