



The Great Burger Palace Heist

Grade 10 math · Pythagorean theorem, Bar models, Multi-step word problems, Word problems, Missing addends · Reading level grades 7-9

Detective: _____ Date: _____

Someone infiltrated the Royal Burger Kitchen and made off with the Golden Recipe Scroll! The thief left behind grease prints, strange tools, and plenty of clues. Analyze the kitchen data to eliminate suspects and catch the culprit before dinner service.

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 Snack Thief is _____

Possible suspects

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

NAME	PRIMARY GADGET	BACKUP DISGUISE	DOMINANT HAND	WIG COLOR	FOOD ALLERGY
Sir Ryan McFly	Fryer Drone	Paper Mascot Mask	Right Handed	Dark Brown	Garlic Powder
Emperor Roman	Spatula Cannon	Cardboard Crown	Left Handed	Golden Blonde	Garlic Powder
Duke Ryan Romanov	Pickle Launcher	Velvet Cape	Left Handed	Golden Blonde	Pickle Juice
Ryan Supreme	Saddle Slinger	Cardboard Crown	Left Handed	Golden Blonde	Pickle Juice
Roman Candle Ryan	Ketchup Blaster	Chef Apron	Right Handed	Golden Blonde	Mustard Gas
Ryan McDonnie	Ketchup Blaster	Paper Mascot Mask	Left Handed	Dark Brown	Pickle Juice
Roman Rains	Spatula Cannon	Chef Apron	Left Handed	Golden Blonde	Pickle Juice
Donnie Doughnut	Saddle Slinger	Paper Mascot Mask	Right Handed	Dark Brown	Mustard Gas
Donnie McCheese	Pickle Launcher	Velvet Cape	Left Handed	Dark Brown	Garlic Powder
Donnie Fries	Spatula Cannon	Cardboard Crown	Right Handed	Flame Red	Mustard Gas
Ryan McCafe	Pickle Launcher	Paper Mascot Mask	Left Handed	Golden Blonde	Pickle Juice
Donnie McDonalds	Fryer Drone	Cardboard Crown	Left Handed	Dark Brown	Mustard Gas
King Roman II	Saddle Slinger	Chef Apron	Left Handed	Flame Red	Mustard Gas
McDonnie the Great	Fryer Drone	Chef Apron	Left Handed	Golden Blonde	Garlic Powder
Donnie Royale	Ketchup Blaster	Cardboard Crown	Left Handed	Flame Red	Pickle Juice
Roman Noodles	Pickle Launcher	Cardboard Crown	Left Handed	Golden Blonde	Pickle Juice
Roman Empire Donnie	Fryer Drone	Chef Apron	Right Handed	Golden Blonde	Garlic Powder
Ryan O Donnie	Saddle Slinger	Velvet Cape	Left Handed	Golden Blonde	Garlic Powder
Sir Roman the Third	Pickle Launcher	Foil Wrapper	Right Handed	Flame Red	Garlic Powder
Donnie McSwag	Spatula Cannon	Cardboard Crown	Left Handed	Golden Blonde	Mustard Gas
Prince Donnie McDuck	Pickle Launcher	Chef Apron	Right Handed	Golden Blonde	Pickle Juice

CLUE 1 Pythagorean theorem

To start the investigation, solve these menu order problems to organize the kitchen logs.

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 18 boxes, and the bottom row has 15 boxes. Some boxes are orange and labeled 'T', while others are white. Numbers are written below each box.

Box Index	Top Row Color	Top Row Label	Bottom Row Color	Bottom Row Label
1	Orange (T)	5	White	34
2	White	15	White	50
3	White	50	White	65
4	White	52	White	20
5	White	111	White	65
6	White	40	White	52
7	White	40	White	50
8	White	65	White	40
9	White	111	White	52
10	White	26	White	50
11	White	75	Orange (T)	5
12	White	74	White	30
13	White	50	White	65
14	White	68	White	123
15	White	26	White	50
16	White	74		
17	Orange (T)	5		

legs 3 and 4, hypotenuse = → **T**

legs 24 and 32, hypotenuse = $\rightarrow$ **L**

legs 20 and 48, hypotenuse = $\rightarrow$ **V**

legs 32 and 60, hypotenuse = $\rightarrow$ **S**

legs 30 and 40, hypotenuse = → **E**

legs 36 and 105, hypotenuse = $\rightarrow$ |

legs 16 and 30, hypotenuse = $\rightarrow$ **W**

legs 18 and 24, hypotenuse = → **C**

legs 24 and 70, hypotenuse = → **0**

legs 25 and 60, hypotenuse = → **A**

legs 9 and 12, hypotenuse = $\rightarrow$ **H**

legs 27 and 120, hypotenuse = → **P**

legs 12 and 16, hypotenuse = $\rightarrow$ **R**

legs 21 and 72, hypotenuse = → **D**

legs 10 and 24, hypotenuse = → **N**

Scratch space:

CLUE 2

Bar model word problems

Next, compare the sales distribution bar models to pinpoint where the intruder breached security.

Draw a bar model to solve each word problem, then write its letter in the boxes to fill in the missing word.

A witness saw the villain was

L									
95	37	116	83	138	109	84		37	

 .

McDonnie used $\frac{2}{5}$ of the sodas on the first day. The other 57 sodas were used the next day. How many sodas were there in all?

draw a bar model

Answer: → **L**

One group collected 55 sundaes and another group collected 54 sundaes. How many sundaes in all?

draw a bar model

Answer: → **A**

One group collected 11 sodas and another group collected 72 sodas. How many sodas in all?

draw a bar model

Answer: → **T**

There were 44 fries in all. 7 fries were used. How many fries are left?

draw a bar model

Answer: → **E**

There were 141 fries in all. 25 fries were used. How many fries are left?

draw a bar model

Answer: → **F**

McDonnie has 7 times as many fries as a teammate. The teammate has 12 fries. How many fries does McDonnie have?

draw a bar model

Answer: → **N**

There were 153 sundaes in all. 15 sundaes were used. How many sundaes are left?

draw a bar model

Answer: → **H**

CLUE 3

Multi-step word problems

Work through these multi step inventory calculations to track down the stolen recipe vault keys.

Solve each problem, then write its letter in the boxes to fill in the missing word.

Someone scared the villain off with P U .

84 10 39 77 53 40 26 10 39 40

McDonnie collected 339 sundaes in the morning and 81 sundaes in the afternoon, then split them equally among 5 Kitchen Crew. How many sundaes did each get?

Answer: → P

McDonnie collected 3 sundaes in the morning and 17 sundaes in the afternoon, then split them equally among 2 Kitchen Crew. How many sundaes did each get?

Answer: → I

McDonnie earned 2 sundaes in each of 5 rounds, plus 54 bonus sundaes. Then 11 sundaes were lost. How many sundaes are left?

Answer: → L

McDonnie collected 266 nuggets in the morning and 196 nuggets in the afternoon, then split them equally among 6 Kitchen Crew. How many nuggets did each get?

Answer: → K

McDonnie earned 8 sodas in each of 3 rounds, plus 18 bonus sodas. Then 3 sodas were lost. How many sodas are left?

Answer: → C

McDonnie earned 5 sodas in each of 6 rounds, plus 20 bonus sodas. Then 10 sodas were lost. How many sodas are left?

Answer: → E

McDonnie earned 5 nuggets in each of 4 rounds, plus 14 bonus nuggets. Then 8 nuggets were lost. How many nuggets are left?

Answer: → J

Scratch space:

CLUE 4

Word problems

Calculate the shortest diagonal escape vector using the Pythagorean theorem to intercept the thief.

Solve each problem, then write its letter in the boxes to fill in the missing word.

A strand of G hair turned up at the scene.

118 46 29 39 81 42 47 29 46 42 39 81

McDonnie found 51 sundaes yesterday and 67 more today. How many sundaes in all?

Answer: → G

There were 71 burgers. 32 were used up. How many burgers are left?

Answer: → D

McDonnie found 11 fries yesterday and 35 more today. How many fries in all?

Answer: → O

McDonnie found 37 sodas yesterday and 10 more today. How many sodas in all?

Answer: → B

There were 51 burgers. 22 were used up. How many burgers are left?

Answer: → L

McDonnie lined up 7 rows of 6 sodas. How many sodas in all?

Answer: → N

McDonnie lined up 9 rows of 9 sodas. How many sodas in all?

Answer: → E

Scratch space:

CLUE 5**Missing addends - the last clue**

Complete these missing addend equations to decode the final lock code on the suspect diary.

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:

$30 + \underline{\quad} = 35$

$10 + \underline{\quad} = 21$

$12 + \underline{\quad} = 21$

$11 + \underline{\quad} = 13$

$14 + \underline{\quad} = 26$

$4 + \underline{\quad} = 8$

$10 + \underline{\quad} = 11$

$6 + \underline{\quad} = 16$

$40 + \underline{\quad} = 47$

$3 + \underline{\quad} = 11$

$33 + \underline{\quad} = 36$

Step 2 - cross out the sentence with each answer:

1. The villain deployed a fryer drone, then wrapped in foil.
2. The villain fired a spatula cannon, then draped a velvet cape.
3. The villain launched pickles, then draped a velvet cape.
4. The villain deployed a fryer drone, then donned a cardboard crown.
5. The villain swung a saddle slinger, then donned a cardboard crown.
6. The villain launched pickles, then put on a mascot mask.
7. The villain swung a saddle slinger, then draped a velvet cape.
8. The villain launched pickles, then wrapped in foil.
9. The villain fired a spatula cannon, then tied a chef apron.
10. The villain blasted ketchup, then put on a mascot mask.
11. The villain launched pickles, then donned a cardboard crown.
12. The villain blasted ketchup, then tied a chef apron.

Answer Key

The Great Burger Palace Heist

Culprit: Ryan McCafe

Pickle Launcher · Paper Mascot Mask · Left Handed · Golden Blonde · Pickle Juice

Trail: Start 21 → Clue 1 18 → Clue 2 11 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Pythagorean theorem): "THE VILLAIN DOES NOT WEAR A VELVET CAPE"

legs 3 and 4, hypotenuse = 5 (T) · legs 24 and 32, hypotenuse = 40 (L) · legs 20 and 48, hypotenuse = 52 (V) · legs 32 and 60, hypotenuse = 68 (S) · legs 30 and 40, hypotenuse = 50 (E) · legs 36 and 105, hypotenuse = 111 (I) · legs 16 and 30, hypotenuse = 34 (W) · legs 18 and 24, hypotenuse = 30 (C) · legs 24 and 70, hypotenuse = 74 (O) · legs 25 and 60, hypotenuse = 65 (A) · legs 9 and 12, hypotenuse = 15 (H) · legs 27 and 120, hypotenuse = 123 (P) · legs 12 and 16, hypotenuse = 20 (R) · legs 21 and 72, hypotenuse = 75 (D) · legs 10 and 24, hypotenuse = 26 (N)

Clue 2 (Bar model word problems): "LEFT HANDED"

McDonnie used $\frac{2}{5}$ of the sodas on the first day. The other 57 sodas were used the next day. How many sodas were there in all? = 95 (L) · One group collected 55 sundaes and another group collected 54 sundaes. How many sundaes in all? = 109 (A) · One group collected 11 sodas and another group collected 72 sodas. How many sodas in all? = 83 (T) · There were 44 fries in all. 7 fries were used. How many fries are left? = 37 (E) · There were 141 fries in all. 25 fries were used. How many fries are left? = 116 (F) · McDonnie has 7 times as many fries as a teammate. The teammate has 12 fries. How many fries does McDonnie have? = 84 (N) · There were 153 sundaes in all. 15 sundaes were used. How many sundaes are left? = 138 (H)

Clue 3 (Multi-step word problems): "PICKLE JUICE"

McDonnie collected 339 sundaes in the morning and 81 sundaes in the afternoon, then split them equally among 5 Kitchen Crew. How many sundaes did each get? = 84 (P) · McDonnie collected 3 sundaes in the morning and 17 sundaes in the afternoon, then split them equally among 2 Kitchen Crew. How many sundaes did each get? = 10 (I) · McDonnie earned 2 sundaes in each of 5 rounds, plus 54 bonus sundaes. Then 11 sundaes were lost. How many sundaes are left? = 53 (L) · McDonnie collected 266 nuggets in the morning and 196 nuggets in the afternoon, then split them equally among 6 Kitchen Crew. How many nuggets did each get? = 77 (K) · McDonnie earned 8 sodas in each of 3 rounds, plus 18 bonus sodas. Then 3 sodas were lost. How many sodas are left? = 39 (C) · McDonnie earned 5 sodas in each of 6 rounds, plus 20 bonus sodas. Then 10 sodas were lost. How many sodas are left? = 40 (E) · McDonnie earned 5 nuggets in each of 4 rounds, plus 14 bonus nuggets. Then 8 nuggets were lost. How many nuggets are left? = 26 (J)

Clue 4 (Word problems): "GOLDEN BLONDE"

McDonnie found 51 sundaes yesterday and 67 more today. How many sundaes in all? = 118 (G) · There were 71 burgers. 32 were used up. How many burgers are left? = 39 (D) · McDonnie found 11 fries yesterday and 35 more today. How many fries in all? = 46 (O) · McDonnie found 37 sodas yesterday and 10 more today. How many sodas in all? = 47 (B) · There were 51 burgers. 22 were used up. How many burgers are left? = 29 (L) · McDonnie lined up 7 rows of 6 sodas. How many sodas in all? = 42 (N) · McDonnie lined up 9 rows of 9 sodas. How many sodas in all? = 81 (E)

Clue 5 (Missing addends): surviving statement is box 6 → Ryan McCafe

$30 + \underline{\quad} = 35 = 5$ · $10 + \underline{\quad} = 21 = 11$ · $12 + \underline{\quad} = 21 = 9$ · $11 + \underline{\quad} = 13 = 2$ · $14 + \underline{\quad} = 26 = 12$ · $4 + \underline{\quad} = 8 = 4$ · $10 + \underline{\quad} = 11 = 1$ · $6 + \underline{\quad} = 16 = 10$ · $40 + \underline{\quad} = 47 = 7$ · $3 + \underline{\quad} = 11 = 8$ · $33 + \underline{\quad} = 36 = 3$