

# MATH MAVEN'S MYSTERIES

Name: \_\_\_\_\_

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

## The Case of the Dastardly Disguiser

Hello there, mathematicians! Math Maven here, stumped by yet another eerie mystery. As always, I need the help of all of you, my clever detectives, if I'm going to crack this case!

It all started for me last week, when I sat down to watch the six o'clock news:

"The famous jewels at Nashville, Tennessee's Country Music Hall of Fame were stolen today," said newscaster Stoney Roberts. "Joining us at the scene is reporter Janet Mitchell."



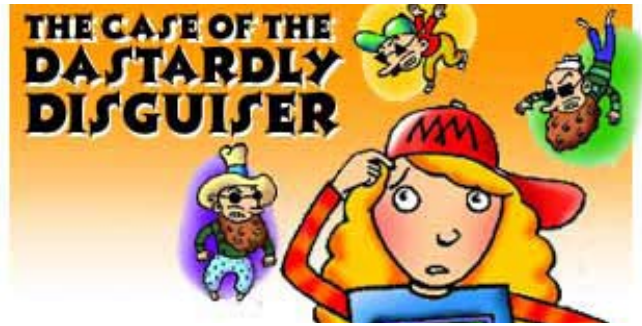
"Thank you, Stoney. Well, the police have not yet been able to target a suspect because there are conflicting eyewitness reports. With me here are two witnesses, Hall of Fame director Barbara Bandshell and tour guide Loretta Linedance. Barbara, did you see suspicious characters during the day?"

"Sure as sugar!" replied Ms. Bandshell, staring into the camera. "This afternoon, a suspicious-looking man entered the museum wearing a cowboy hat, dark, round sunglasses, and a long, curly beard. He joined the tour to see the Hall of Fame diamonds, so I thought Loretta would keep an eye on him."

"But I didn't see a man like that," piped up Loretta Linedance. "When our group entered the Diamond Room, I could not find the gentleman with the cowboy hat. But I did see a man wearing a baseball cap, triangular sunglasses, and a short mustache standing right beside the diamonds. I didn't suspect anything, because he was real nice. He even tipped his hat and said, 'Howdy, Ma'am.'" Then Ms. Linedance lowered her voice. "But as we were leaving the room, I turned back and noticed the diamonds were gone."



"Strangely, police interviews with security guards reveal yet another suspect," the reporter continued. "They remember a man with a sailor hat, dark, square sunglasses, and a long, curly beard. Nashville Chief of Police, Billy Jay Cyprus, asks anyone with information to contact the police department immediately. Stoney, back to you."



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I knew immediately that it could be none other than the Dean of Deception—the Dastardly Disguiser! I quickly telephoned the chief to offer assistance. I knew that with the help of all of you we could solve this mystery!

“Math Maven, thank goodness! You and your math detectives must come down to the station immediately. I have something you need to see,” cried the chief.

No sooner had we walked into Chief Cyprus’s office when I heard the Disguiser’s weasely voice. A video was playing on the chief’s television set:



“Yes, Chief Cyprus—I’m back!” snickered Dastardly on the screen. “And if I know you, you’ve sought help from that sly Math Maven and her sneaky detectives! Well, all of you together won’t be able to catch me this time—because you’ll never be able to find me in my many mischievous disguises!”

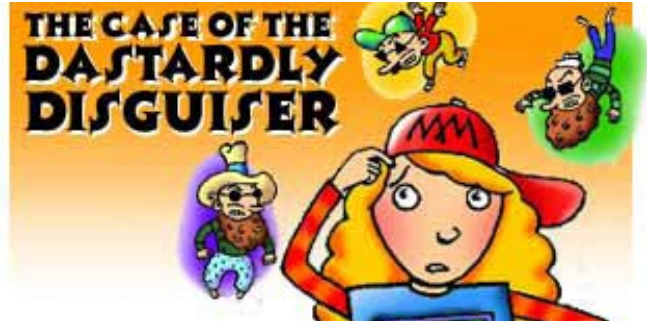
Right before our very eyes, Dastardly showed off his disguises: the sailor hat perched on his head changed to a cowboy hat, then to a baseball cap. His long, curly beard suddenly shriveled to a mustache, and his sunglasses changed from square to triangular to round. All the different disguises seen by the witnesses appeared as if by magic!

“Yoo-hoo! Made you look! Ha! Ha!” cried the evil mathematical fiend as his appearance kept changing magically.

“Give it up, Math Maven! You and your lily-livered little calculator-packing detectives think you’re up to the challenge? Well, we’ll see about that,” sneered Dastardly. With that, the screen went blank.

The despondent chief stopped the tape. “It’s hopeless, Math Maven! He has too many disguises—we’ll never be able to catch him.”

“Don’t give up, Chief!” I said. “The way to nab Dastardly is to map out his strategy! To catch him, we need to recognize him. And the only way to do that is to list all his possible disguises. We can also use multiplication to determine the number of different disguises he’s using.”



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## Solve the Mystery!

Help Chief Billy Jay Cyprus put Dastardly behind bars and return the diamonds to the Country Music Hall of Fame! What is the total number of possible disguises Dastardly could use?

Remember, Dastardly was seen in

- a cowboy hat, a baseball cap and a sailor hat
- round, triangular, and square sunglasses
- a long, curly beard and a short mustache

BONUS: What is the probability that Dastardly will be caught wearing the cowboy hat? (Express your answer as a fraction in lowest terms.)

Chief Cyprus needs your help to find the Disguiser and the precious diamonds! What is the total number of possible disguises Dastardly could use?

- A. 9
- B. 27
- C. 19
- D. 29

Use this space to show your work: