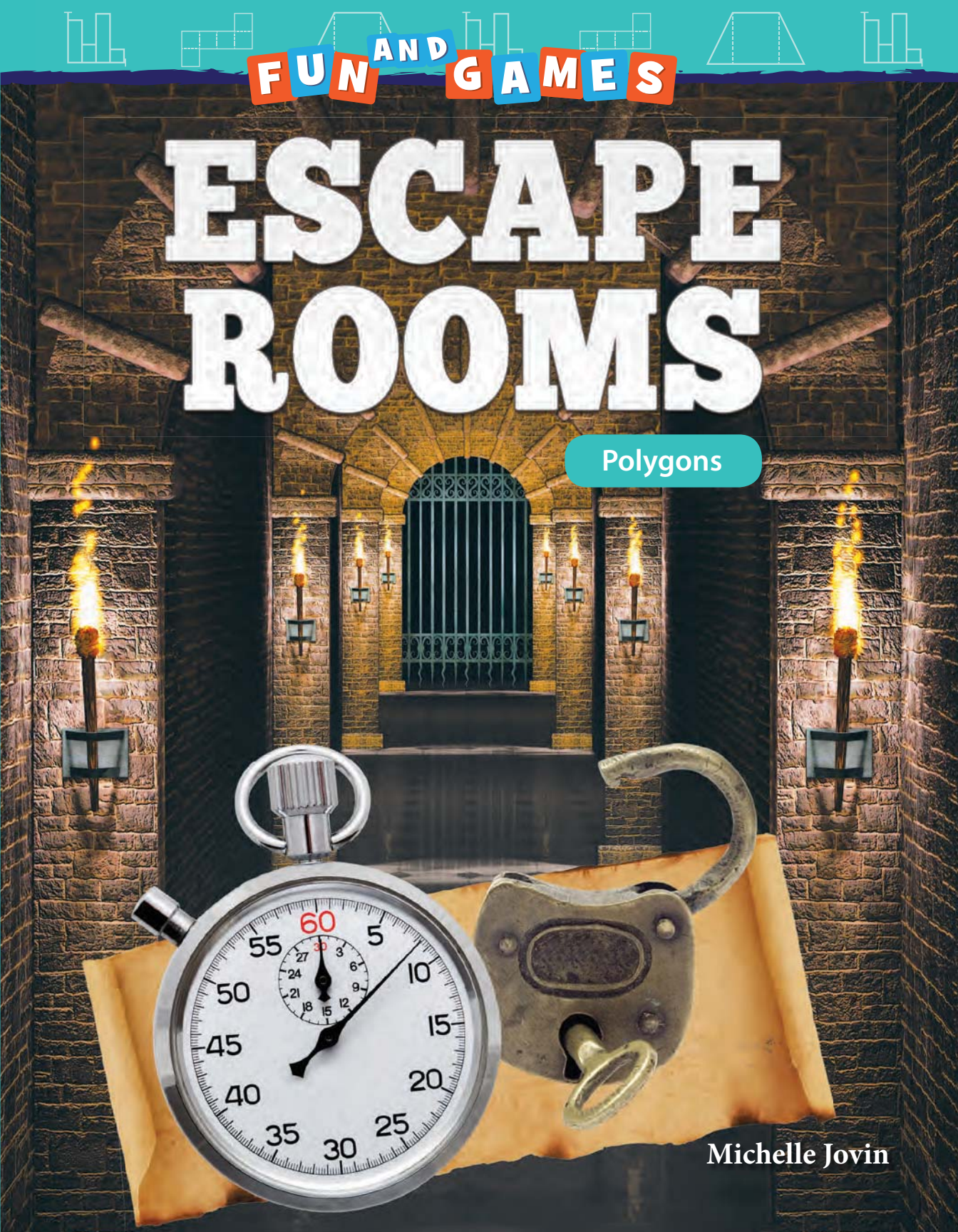
FUN AND GAMES

ESCAPE ROOMS

Polygons



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The King's Keep

"Welcome to The King's **Keep**, everyone," Aaliyah, the escape room host, tells the group cheerfully. "I hope you are all excited. We have a great adventure in store for you!" Susan and Kristina high-five, while Scott and Edward fist-bump. They have been planning this **excursion** for months, and they are ready to win. The group puts their phones and other belongings in a lockbox.

"Okay everyone, just a quick reminder of how escape rooms work," Aaliyah continues. "You will have 60 minutes to escape a locked room—if you make it out before 60 minutes, you win. However, if you take too long, your team loses. Everything you see in the room could be a clue to escape, so make sure you pay attention to all your surroundings. If you get stuck and don't know what to do next, you can use this **walkie-talkie** to ask for a clue. However, you can only ask for three clues during the whole time you are in the room, so use them wisely. Does anyone have any questions about how the escape room is played?"

The friends shake their heads. "Great. Now if you'll follow me, I can take you to your room," Aaliyah says as she walks down a long hallway.

Let the Countdown Begin

Aaliyah stops in front of a wooden door marked with the number three and hands Susan a clipboard and a pencil. "Before you is the entrance to The King's Keep," Aaliyah says. "Imagine you are the princes and princesses of a faraway land. A **usurper** has taken your thrones and put you in the dungeon of your castle. In just 60 minutes, the usurper will be crowned king. Can you escape in time to show everyone that you are the rightful **heirs**, or will you lose your kingdom forever?" With that dramatic introduction, Aaliyah smiles, opens the door, and ushers the team inside. The team walks inside, and Kristina spots a red digital timer at the far end of the room. As Aaliyah shuts the door, the timer begins.

The King's Keep entrance

60 Minutes Left

As the first seconds tick away, everyone looks around for clues. Scott spots some maps and a plastic sword chained to the wall, while Edward sees a stack of books on a bookshelf. Meanwhile, Susan spies a golden chest with a lock on it, and Kristina sees a chessboard with the kings and queens missing. Without any obvious place to start, the team continues to search the room for clues.

Let's Explore Math

While looking at the chessboard, Kristina notices that by viewing each square as a square unit, many different quadrilaterals can be formed. The team wonders if these shapes can be clues. What are possible dimensions for the quadrilaterals that team members find?

1. Susan sees a square with an area of 16 square units.
2. Edward sees a non-square rectangle with an area of 16 square units.
3. Scott sees three different rectangles with perimeters of 20 units.

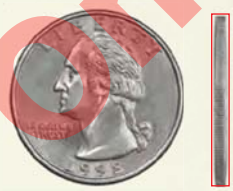
There must be something I have to do with these, Edward thinks as he gazes at the books. Just then, he notices that the pictures on the front covers of the books match the pictures on the maps that Scott found. Edward starts to sort the books in the same order that the maps are on the wall. When he puts the last book in place on the bookshelf, a hidden drawer in the wall pops open. Edward rushes over to the drawer and finds a tiny golden key.

50 Minutes Left

"Hey Susan," Edward shouts excitedly, "will this key work on that chest right next to you?" Susan hurries over to get the key from Edward, and sure enough, the key fits the lock on the chest. Susan screeches with excitement and pulls out four metal coins and a smaller wooden chest. Susan and Edward set the new clues on a table. The smaller wooden chest is closed and there is no lock. Instead, the only **distinguishing** feature at the top is a narrow opening.

LET'S EXPLORE MATH

The team knows the opening on the chest is too narrow for the coins. Coin slots are rectangular because if you turn coins and look at their edges, they look rectangular. Imagine a coin slot that is 3 units wide and 12 units long. The coordinates are vertices for the rectangular edges of three different coins. Would each coin fit in the slot? Explain your reasoning.



1. (−2, 4), (2, 4), (−2, −10), (2, −10)

2. (0, −1), (1, −1), (1, −14), (0, −14)

3. (−5, 3), (−5, −6), (−3, 3), (−3, −6)