

# One Minute Mysteries: 65 Short Mysteries You Solve with Math

## SAMPLE MYSTERIES:

### Cover Up

As a birthday present to her little sister Laura, Miranda had promised to paint the inside of the playhouse for her.

Years before their father had painted the walls and floor pink, Miranda's favorite color. But Laura was the one using it now and her favorite color was blue. She wanted the pink covered up.

On a spring Saturday afternoon, their family went to the hardware store to pick out paint. Laura chose a shade of blue that she liked. Her father had warned Miranda that covering up the pink would require two coats of paint. Since she was paying for it out of her own money, she didn't want to buy too much.

Earlier she had measured the inside of the playhouse to see how much she would need to paint. The two sides were 10 feet long and six feet high, and the ends were six feet long and six feet high. Above that was the inside of the roof, which didn't need to be painted.

"Okay," here's a quart can that says it will cover 400 square feet," Miranda said. "This can will be enough."

"Do you think you should buy two cans?" her father asked.

"Why would I need two?" Miranda replied.

### *Solution:*

Miranda said, "Each side is 60 square feet—10 times six—so together they would be twice that, or 120 square feet. The ends are 36 square feet each—six times six—so together they would be twice that, or 72 square feet. And 120 plus 72 is 192 square feet to paint. Painting that twice means I need to paint 384 square feet. So a can that covers 400 square feet is enough."

"Enough to cover the walls, but not the floor, too," her father said. "Remember, you also need to cover the pink there."

"Oops, I didn't measure the floor," Miranda said.

"Can't you figure that out?" he asked.

"Oh, right," she said. "The sides are 10 feet long and the ends are six feet long. So that means the floor is six times 10, or 60 square feet. Painting that twice means I have to cover another 120 square feet. So I need to cover 504 square feet—384 plus 120—in total. That means I'll need to buy two cans."

### The Long Run

"I don't know, honey," Mia's mother said when Mia brought home a flyer from school inviting everyone to run in a mother-daughter charity race on Mother's Day. "I haven't jogged since college."

"They don't even *call* it jogging anymore, Mom. It's running," Mia said. "But you can do it. It's only three miles. I'll run with you." Mia was a good runner and ran on the middle school track team.

Mia's mother decided to try. She got a pedometer, a device that measures how far you have run by the length of your stride. She figured out the length of her stride by counting her steps while running 100 yards at the local football field.

For training, she thought that running uphill all the way would help her get in better shape, so using her pedometer, Mia's mother worked out a three-mile route from a spot far downhill from where they lived. Every other day, Mia's father dropped them off there and they ran home.

On the day of the race, Mia had no problem covering the distance. Mia's mother managed to finish, but it was a struggle.

"That course seemed really long," Mia's mother said, panting at the finish line. "Maybe they measured it wrong?"

### *Solution:*

"You measured *our* course wrong," Mia said.

"No, I'm sure I set the pedometer correctly," her mother said.

"Yes, but you set it according to the length of your stride running on the level on the football field," Mia said. "When you run uphill, you use shorter steps. That means you are covering a shorter distance per step than when you run on the level. So, in our training, we actually were running less than three miles. I didn't tell you then because I didn't want you to get discouraged. I thought once you got in the race you could go the extra distance, and you did."

### **Compounding His Interest**

“But Grandpa, and Grandma, college is a million years away!” Damien said when they started talking to him about college.

Damien’s family was having a party to celebrate his eighth grade graduation. He would be going to the high school in the fall.

“I’m sure it seems like a long time to you,” his grandfather said. “But it’s time we started making sure you’ll have enough money for college. So here’s what we’re going to do. We’ve opened a bank account and put \$1,000 in it for you.”

“A thousand dollars!” Damien said.

“College is expensive,” his grandmother said. “It’s because we went to college that we can afford to do this. And we intend to do this each summer for the next four years too. Plus, we’re going to increase what we give you 10 percent a year, because college is getting more expensive all the time.”

“I don’t know what to say, except thanks so much,” Damien said. “Let’s see, by the time I start college I will have, um, \$5,400.”

“Will you really?” his grandfather asked.

#### *Solution:*

“I see what you mean,” Damien said. “At first I thought that by adding 10 percent next year and for the three following years, you were talking about 10 percent on the \$1,000 each year. So that would have been \$5,400—this year’s \$1,000 plus \$1,100 for four more years.

“But you said you were going to increase what you gave by 10 percent each year, which means compound interest. So next year you plan to give me \$1,100—10 percent more than \$1,000. In the third year, it would be \$1,210—10 percent more than \$1,100.” Damien got out a sheet of paper to do the rest of the calculations. “In the fourth year, it would be \$1,331, and in the fifth year, the year I finish high school, it would be \$1,464. So you’re planning to give me \$1,000 plus \$1,100 plus \$1,210, plus \$1,331 plus \$1,464—that’s \$6,105 in all. It’s very generous of you.”