

# MATHCOUNTS® Problem of the Week Archive

## Columbus Day – October 8, 2018

### Problems & Solutions

Christopher Columbus landed in the Americas accidentally. He was actually trying to find a faster trade route to Asia from Spain. Instead of sailing around the tip of Africa, Columbus believed he could sail west across the Atlantic Ocean to reach Asia. In planning his expedition, Columbus calculated the journey would be around 2300 miles, based on his estimation of the earth's size. Nautical experts of the time disagreed with his calculations, estimating the distance would be closer to 12,200 miles. The distance Columbus calculated is what percent of the distance estimated by nautical experts of the time? Express your answer to the nearest tenth.

*To find what percent the distance Columbus calculated is of the distance estimated by the nautical experts, we divide Columbus's distance by the experts' distance, then multiply by 100. The percentage is  $2300 \div 12,200 \times 100 \approx 18.9\%$ .*

By estimating the distance, sailors could determine how long a voyage would take, and, therefore, ensure that enough food and supplies were packed to last the entire trip. The ships of Christopher Columbus's day averaged approximately 4 knots. A knot, or nautical mile per hour, is a measure of speed at sea. A nautical mile is approximately 1.151 miles. Based on this and information from the previous problem, how many more days would Columbus be at sea traveling the distance estimated by nautical experts than traveling the distance he calculated? Express your answer to the nearest whole number.

*Based on the previous problem, the difference between the distance estimated by the experts and the distance calculated by Columbus is  $12,200 - 2300 = 9900$  mi. Converting this to nautical miles, we get  $9900 \div 1.151 \approx 8601$  nautical miles. To cover that distance traveling at 4 nautical miles/hour = 96 nautical miles/day, it would take another  $8601 \div 96 \approx 90$  days.*

After learning about Christopher Columbus in school, Nina decided to build a replica of the largest of Columbus's three ships, the Santa Maria. She bought a Santa Maria model kit, which said the final constructed model would be  $1/78$  the size of the original ship. Once Nina finished constructing the model, she measured its length to be 18 inches. If the model is to the scale it claimed, what was the length, in feet, of the actual Santa Maria on which Columbus and his men sailed?

*Since the scale is  $1/78$ , or 1 to 78, the length of the original ship is 78 times the length of the model. Nina measured her model to be 18 inches = 1.5 feet, so the original ship would have been  $1.5 \times 78 = 117$  feet.*

# **MATHCOUNTS<sup>®</sup> Problem of the Week Archive**

## ***Columbus Day – October 8, 2018***

### ***Problems***

Christopher Columbus landed in the Americas accidentally. He was actually trying to find a faster trade route to Asia from Spain. Instead of sailing around the tip of Africa, Columbus believed he could sail west across the Atlantic Ocean to reach Asia. In planning his expedition, Columbus calculated the journey would be around 2300 miles, based on his estimation of the earth's size. Nautical experts of the time disagreed with his calculations, estimating the distance would be closer to 12,200 miles. The distance Columbus calculated is what percent of the distance estimated by nautical experts of the time? Express your answer to the nearest tenth.

By estimating the distance, sailors could determine how long a voyage would take, and, therefore, ensure that enough food and supplies were packed to last the entire trip. The ships of Christopher Columbus's day averaged approximately 4 knots. A knot, or nautical mile per hour, is a measure of speed at sea. A nautical mile is approximately 1.151 miles. Based on this and information from the previous problem, how many more days would Columbus be at sea traveling the distance estimated by nautical experts than traveling the distance he calculated? Express your answer to the nearest whole number.

After learning about Christopher Columbus in school, Nina decided to build a replica of the largest of Columbus's three ships, the Santa Maria. She bought a Santa Maria model kit, which said the final constructed model would be  $\frac{1}{78}$  the size of the original ship. Once Nina finished constructing the model, she measured its length to be 18 inches. If the model is to the scale it claimed, what was the length, in feet, of the actual Santa Maria on which Columbus and his men sailed?