# MATHCOUNTS® Problem of the Week Archive

## *U.S. Flag Day – June 14, 2021*

## *Problems & Solutions*

The United States celebrates the U.S. flag on June 14th. Each year, many towns across the country display U.S. flags on poles along both sides of the length of the main street through town.

Main Street in Typical Town is exactly 1.5 miles long. The local Girl Scout troop has agreed to place a flag on a pole on each side of the beginning of Main Street and to place flags every 30 feet to the other end of Main Street. How many flags do they need to place flags on both sides of Main Street?

*There are 5280 feet in a mile. The length of Main Street is 1.5 × 5280 = 7920 feet. So, if flags are placed every 30 feet from one end of Main Street to the other, there will be 7920 ÷ 30 = 264 spaces between flags. A flag is placed at the beginning of Main Street and the rest of the flags are placed at the end of every space between flags. Therefore, 265 flags are needed for one side of Main Street. Since they are placing the flags on both sides of Main Street, they need 2 × 265 =* ***530*** *flags.*

The official ratio of the fly (length) to hoist (width) of the rectangular flag of the United States is 1.90 to 1.00 as set by Executive Order 10834. There is a list of eleven permissible specific flag sizes (specified by fly × hoist) for flags displayed over government agencies: 38.00 × 20.00; 19.00 × 10.00; 17.00 × 8.95; 11.00 × 7.00; 9.50 × 5.00; 5.50 × 4.33; 6.65 × 3.50; 4.00 × 3.00; 5.70 × 3.00; 4.50 × 2.37; and 2.50 × 1.32. Expressing each ratio as a decimal to the nearest hundredth, how many of these 11 flag dimensions are in the official 1.90:1.00 ratio? What is the range of the ratios?

*We can calculate the ratios as follows:*

*38.00 ÷ 20.00 = 1.90*

*19.00 ÷ 10.00 = 1.90*

*17.00 ÷ 8.95 = 1.899... ≈ 1.90*

*11.00 ÷ 7.00 = 1.571... ≈ 1.57*

*9.50 ÷ 5.00 = 1.90*

*5.50 ÷ 4.33 = 1.270... ≈ 1.27*

*6.65 ÷ 3.50 = 1.90*

*4.00 ÷ 3.00 = 1.333... ≈ 1.33*

*5.70 ÷ 3.00 = 1.90*

*4.50 ÷ 2.37 = 1.898... ≈ 1.90*

*2.50 ÷ 1.32 = 1.893... ≈ 1.89*

*There are **7** flags that are in the official ratio of 1.90. The greatest ratio is 1.90 and the smallest ratio is 1.27, so the range of the ratios is 1.90 – 1.27 = **0.63**.*

The ratio of the diameter of each star on the United States flag to the hoist is 0.0616 to 1.0000. What is the diameter, in inches, of each of the 50 stars on a United States flag that has a fly of 38 inches and a hoist of 20 inches? Express your answer as a decimal to the nearest hundredth.

*The ratio of the star diameter to the hoist is 0.0616 to 1.0000. Let d represent the diameter of the star. We can use the proportion (0.0616/1.0000) = (d/20). Solving for d, we get d = **1.23** inches, to the nearest hundredth.*

# MATHCOUNTS® Problem of the Week Archive

## *U.S. Flag Day – June 14, 2021*

## *Problems*

The United States celebrates the U.S. flag on June 14th. Each year, many towns across the country display U.S. flags on poles along both sides of the length of the main street through town.

Main Street in Typical Town is exactly 1.5 miles long. The local Girl Scout troop has agreed to place a flag on a pole on each side of the beginning of Main Street and to place flags every 30 feet to the other end of Main Street. How many flags do they need to place flags on both sides of Main Street?

The official ratio of the fly (length) to hoist (width) of the rectangular flag of the United States is 1.90 to 1.00 as set by Executive Order 10834. There is a list of eleven permissible specific flag sizes (specified by fly × hoist) for flags displayed over government agencies: 38.00 × 20.00; 19.00 × 10.00; 17.00 × 8.95; 11.00 × 7.00; 9.50 × 5.00; 5.50 × 4.33; 6.65 × 3.50; 4.00 × 3.00; 5.70 × 3.00; 4.50 × 2.37; and 2.50 × 1.32. Expressing each ratio as a decimal to the nearest hundredth, how many of these 11 flag dimensions are in the official 1.90:1.00 ratio? What is the range of ratios?

The ratio of the diameter of each star on the United States flag to the hoist is 0.0616 to 1.0000. What is the diameter, in inches, of each of the 50 stars on a United States flag that has a fly of 38 inches and a hoist of 20 inches? Express your answer as a decimal to the nearest hundredth.