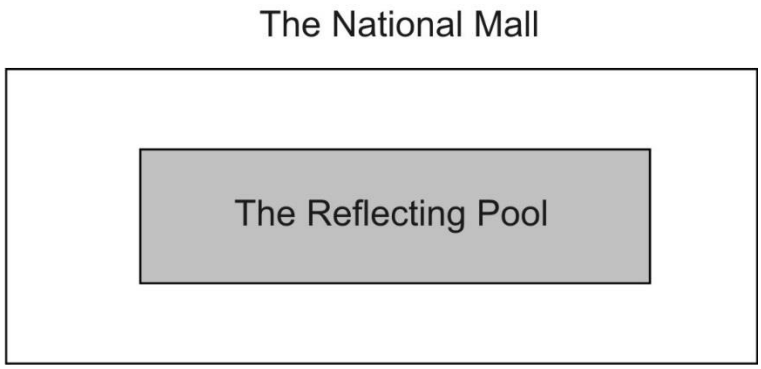
MATHCOUNTS® Problem of the Week Archive

Martin Luther King, Jr. Day – January 16, 2023

Problems & Solutions

Every year on the third Monday of January, we celebrate Martin Luther King, Jr. Day. Dr. King was a civil rights activist whose passion and leadership led to great cultural changes in America.

On Aug. 23, 1963, 250,000 people gathered in front of the Lincoln Memorial in Washington, DC for the "March on Washington," and Dr. King made his famous "I have a dream…" speech. The mall in front of the Lincoln Memorial is 5/8 of a mile long and 1/4 of a mile wide, and the Reflecting Pool is 2029 feet long and 167 feet wide. If all of the participants stood on the mall but no one stood in the Reflecting Pool, and assuming everyone spread out evenly over the entire area, how many square feet did each participant have? Express your answer as a decimal to the nearest tenth.



First, we need to figure out how much standing space there is by subtracting the area of the Reflecting Pool (in square feet) from the area of the mall (in square feet). First, let's find the dimensions of the mall in square feet. We are given that the length of the mall is 5/8 of a mile, which is (5/8) × 5280 = 3300 feet. We are given that the width of the mall is 1/4 of a mile, which is (1/4) × 5280 = 1320 feet. So, the mall in front of the Lincoln Memorial is 3300 × 1320 = 4,356,000 square feet. The Reflecting Pool is 2029 × 167 = 338,843 square feet. So, the amount of space where participants could stand is 4,356,000 – 338,843 = 4,017,157 square feet. Thus, the amount of space per participant is 4,017,157 ÷ 250,000 ≈ ***16.1*** *square feet.*

The King Center is a 35-acre site dedicated to "educating the world on the life, legacy and teachings of Dr. Martin Luther King, Jr., inspiring new generations to carry forward his unfinished work, strengthen causes and empower change-makers who are continuing his efforts today." Approximately 650,000 people visit The King Center annually. It is open 10am – 5pm, 7 days per week. On average, how many people enter The King Center each hour? Express your answer as a decimal to the nearest tenth.

Since The King Center is open from 10am – 5pm, it is open for 7 hours per day. So, The King Center is open for (7 hours per day)(365 days per year) = 2555 hours per year. Dividing the number of visitors by

the number of hours the center is open, we find that, on average, 650,000 ÷ 2555 ≈ ***254.4*** *people enter The King Center every hour.*

On November 2, 1983, a bill was signed making Martin Luther King, Jr. Day a federal holiday. At the same time on January 16, 2023, how many days will have passed since the bill was signed? (Hint: Don't forget leap years.)

In a regular year, there are 365 days. From January 16, 1984 to January 16, 2023, there were 39 full years, which is (39 years)(365 days per year) = 14,235 days (not yet including the adjustment for leap years). From November 2, 1983 to December 1, 1983, there were 29 days, and from December 1, 1983 to January 1, 1984, there were 31 days. Additionally, there were 15 days from January 1, 1984 to January 16, 1984. So, 29 + 31 + 15 = 75 days, for a total of 14,235 + 75 = 14,310 days. Now, let's go back to consider the leap years. The years 2020, 2016, 2012, 2008, 2004, 2000, 1996, 1992, 1988 and 1984 are leap years, so we must add 10 days (one for each leap year) to our total to get 14,310 + 10 = ***14,320*** *days since the bill was signed.*

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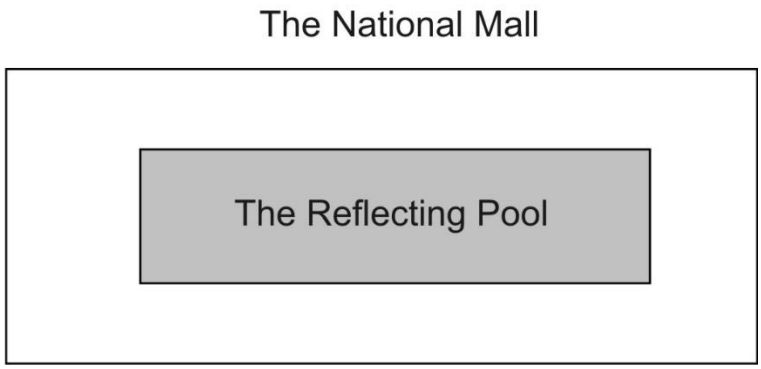

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