

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

## To Grandmother's House – December 23, 2024

### *Problems & Solutions*

For the holidays, Mai and Taya will travel over the river and through the woods to their grandmother's house a total distance of 495 miles. If the car they will drive uses, on average, a gallon of gasoline every 33 miles, how many gallons of gas will the girls use to drive to their grandmother's house?

*If the car uses 1 gallon of gasoline every 33 miles driven, it will take  $495 \div 33 = 15$  gallons of gasoline to drive to their grandmother's house.*

Prior to departing, Taya noticed that the car did not have a full tank of gasoline. In fact, the car's fuel gauge indicated that the  $12\frac{1}{2}$  gallon tank was only  $\frac{1}{4}$  full. If Tara paid \$33.75 at the local gas station to fill the car's tank with gasoline, how much did the gas station charge per gallon of gasoline?

*If the car's gas tank was  $\frac{1}{4} = 0.25$  full, that means Taya purchased  $0.25 \times 12.5 = 3.125$  gallons of gasoline to fill the tank. Since she spent a total of \$33.75 the gas station must have charged  $33.75 \div 3.125 = \$10.80$  per gallon of gasoline.*

Mai and Taya began their trip with a full tank of gas. They drove until there was  $\frac{1}{4}$  tank of gas remaining and then stopped to fill up the tank. If the girls made no other stops, how many gallons of gasoline remained in the car's tank when they arrived at their grandmother's house? Express your answer as a decimal to the nearest thousandth.

*From the previous problem we know that when  $\frac{1}{4}$  of a tank of gas remains in this car 3.125 gallons of gasoline has been used. It follows that the remainder of the trip used  $15 - 3.125 = 11.875$  gallons of gasoline. Therefore, when they arrived at their grandmother's house,  $12.5 - 11.875 = 0.625$  gallons of gas remained in the car's tank.*

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