MATHCOUNTS® Problem of the Week Archive

Mother's Day – May 15, 2017

Problems & Solutions

Anna asked six of her friends for the age in years of their mothers, shown in the table below. What is the positive difference between their mean and median age?

Friend	Ashley	Dawn	Jennifer	Laura	Sarah	Shawna
Age in years	28	36	27	31	35	29

To find the mean age add the ages and divide by the number of mothers, (28 + 36 + 27 + 31 + 35 + 29) ÷ 6 = 31. Another way to find the mean is to order the ages and use a leveling process. The ages in order are 27, 28, 29, 31, 35, 36. Assume that one of the ages is the mean, for example 31. Comparing each of the ages to 31 gives – 4, – 3, – 2, 0, + 4, and + 5. The sum of these values is 0 and the mean is 31. To find the median age order the ages and find the middle value; 27, 28, 29, 31, 35, 36. Since there are an even number of ages, the median is the mean of the middle two values; (29 + 31) ÷ 2 = 30. The positive difference between the mean and the median is |30 – 31| = ***1****.*

Brent takes his mother to a restaurant for Mother's Day Brunch. They can select as much food as they want from the buffet for a cost of $15.00 each or they can order from the ala carte menu, shown in the table below, and pay for each item separately. Brent orders the buffet and his mother orders one of each item from the ala carte menu. There is a 6% sales tax and a 15% service fee, both of which are based solely on the price of the food. What is the amount of the total bill including the tax and service fee?

Ala Carte	Orange Juice	Toast	Cereal	2 Eggs	Bacon	Fruit	Potatoes
Cost	$1.50	$1.75	$1.50	$2.00	$1.75	$1.50	$1.50

*The cost of the buffet is $15.00. The cost of the items on the Ala Carte Menu is $1.50 + $1.75 + $1.50 + $2.00 + $1.75 + $1.50 + $1.50 = $11.50. The cost of the food is $15.00 + $11.50 = $26.50. The sales tax is 6% of 26.50 = $1.59. The service fee is 15% of $26.50 = $3.975. The total bill is $26.50 + $1.59 + $3.975 ≈ $****32.07****.*

Tasha is making 5 flower pots for her mother for Mother's Day. Each flower pot is a cylindrical can that has a diameter of 7 inches and a height of 8 inches. She fills each flower pot 3/4 full with potting soil. What is the total number of cubic inches of potting soil she needs for the 5 flower pots? Express your answer to the nearest whole number.

The formula for the volume of a cylinder is the area of the base (pi times the radius squared) times the height. Multiply the volume by 3/4 and then multiply by 5 to find the total volume of potting soil needed. $\pi \times 3.52 \times 8 \times (3/4) \times 5 = 1154.5353$. *She needs* ***1155*** *cubic inches of potting soil.*

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