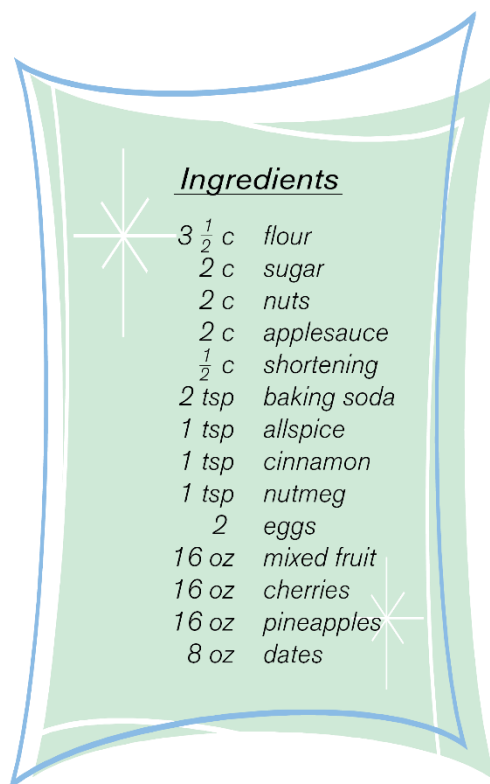


# MATHCOUNTS<sup>®</sup> Problem of the Week Archive

## Baking Fruit Cake – December 4, 2023

### Problems & Solutions

Allie plans to make a fruit cake for her family plus four more to give away to friends. Shown here is a list of the ingredients required to make a fruit cake according to Allie's recipe. How many ounces of mixed fruit are needed for Allie to make five fruit cakes, according to her recipe?



According to the ingredients shown, each cake requires 16 ounces of mixed fruit. Therefore, to make 5 cakes, Allie will need  $16 \times 5 = \mathbf{80}$  ounces of mixed fruit.

For three of the fruit cakes Allie is baking, instead of using shortening, she will substitute it with applesauce. One-half cup of applesauce can be substituted for each cup of shortening. For the remaining two fruit cakes, Allie will use shortening as instructed in the recipe. With these substitutions, what is the total number of cups of applesauce Allie needs to make the five fruit cakes? Express your answer as a mixed number.

Allie's recipe requires 2 cups of applesauce per fruit cake, and she plans to substitute applesauce for the shortening in three of the fruit cakes. So, as written, the recipe requires  $2 \times 5 = 10$  cups of applesauce to make five fruit cakes. In each of three fruit cakes the  $\frac{1}{2}$  cup of shortening will be replaced with applesauce. We are told that 1 cup of shortening can be replaced with  $\frac{1}{2}$  cup of applesauce. Therefore, the  $\frac{1}{2} \times 3 = 1\frac{1}{2}$  cups of shortening will be replaced with  $1\frac{1}{2} \times \frac{1}{2} = \frac{3}{4}$  cup of applesauce. Thus, the total amount of applesauce Allie needs to make the five fruit cakes is  $10 + \frac{3}{4} = \mathbf{10\frac{3}{4}}$  cups.

According to the recipe each cake must bake in the oven at 300 degrees for exactly 1 hour 15 minutes. Allie's oven is only large enough to accommodate baking one cake at a time. So once a fruit cake finishes baking, she immediately puts the next fruit cake in the oven. If Allie puts the first fruit cake in the oven at 9:45 a.m., at what time will she remove the fifth fruit cake from the oven?

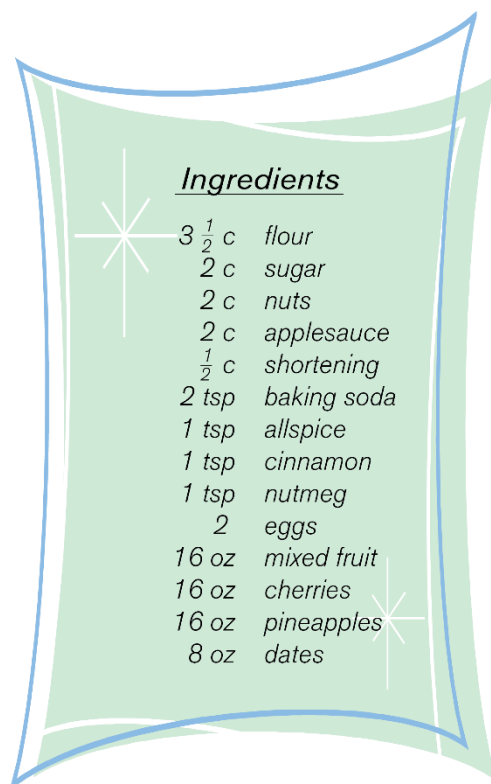
*Allie will bake five fruit cakes for 1 hour 15 minutes each. That's a total of 6 hours 15 minutes. If she puts the first fruit cake in the oven at 9:45 a.m., and then puts another fruit cake in the oven immediately after taking a fruit cake out of the oven, she will remove the fifth fruit cake from the oven at **4:00** p.m.*

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

## Baking Fruit Cake – December 4, 2023

### Problems

Allie plans to make a fruit cake for her family plus four more to give away to friends. Shown here is a list of the ingredients required to make a fruit cake according to Allie's recipe. How many ounces of mixed fruit are needed for Allie to make five fruit cakes, according to her recipe?



For three of the fruit cakes Allie is baking, instead of using shortening, she will substitute it with applesauce. One-half cup of applesauce can be substituted for each cup of shortening. For the remaining two fruit cakes, Allie will use shortening as instructed in the recipe. With these substitutions, what is the total number of cups of applesauce Allie needs to make the five fruit cakes? Express your answer as a mixed number.

According to the recipe each cake must bake in the oven at 300 degrees for exactly 1 hour 15 minutes. Allie's oven is only large enough to accommodate baking one cake at a time. So once a fruit cake finishes baking, she immediately puts the next fruit cake in the oven. If Allie puts the first fruit cake in the oven at 9:45 a.m., at what time will she remove the fifth fruit cake from the oven?