

# Sharon Math and Science Tournament Sample Questions (Released 2021)

## Sample Questions for Team Round

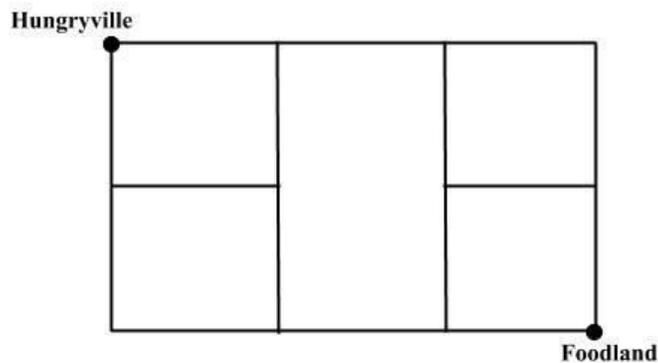
*Disclaimer: This test may not reflect exact test format and difficulty, but it will give you a general sense of the type of questions you may see.*

### Math Section

1. What is the least positive integer with exactly 8 factors?
2. Consider the equation below. How many solutions does  $x$  have?

$$32^{x-2} = \left(\frac{1}{2}\right)^{10-5x}$$

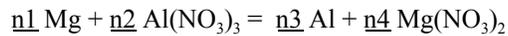
3. Write the decimal 0.45454545... as a fraction.
4. Jim is currently in Hungryville, famished, and he wants to get to Foodland as soon as possible by taking the shortest path. How many paths from Hungryville to Foodland will fulfill Jim's requirements?



5. The probability of tomorrow being a snow day, given that today is a snow day, is 31%. The probability of tomorrow not being a snow day given that today is not a snow day, is 80%. Suppose the days are independent. What is the probability of the day after tomorrow being a snow day, if today is not a snow day? Express your answer as a percentage to the nearest tenth.

## Science Section

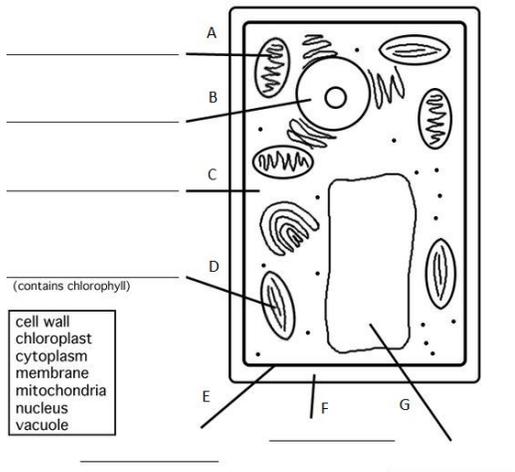
1) Balance the equation to the lowest ratio for n1, n2, n3, and n4. Write your answer in the format of n1, n2, n3, n4 (Partial points will be awarded for each part. 0.75 point per part)



2) List all the five layers of atmosphere in order starting from the bottom. (Partial points will be awarded for each layer. 0.6 point per layer)

3) Label ANY four parts of the plant cell. (Partial points will be awarded for each part. 0.75 point per part).

### Basic Parts of a Plant Cell



4) The density of a solvent is 800 grams per milliliter. What is the mass, in pounds of the solvent if it fills a container that measures 30 mm x 40 mm x 100 mm? (3 points)

5) List all four bases of DNA strand. (Partial points will be awarded for each part. 0.75 point per part)

