Basic probability

0 points possible (ungraded)

Crazy Tim, your local hardware store, has accumulated an inventory of thousands of leftover tubes over several decades, and is now having a huge clearance sale to get rid of them. All these leftover tubes will be priced at 1 cent a piece, until the inventory is depleted. Tim, the store owner, has classified the tubes that will go on sale during the event into 27 types, including 23 types of what he calls non-straight tubes. These last ones are grouped as follow:

U-Shaped	L-Shaped	Y-Shaped	T-Shaped
5 types	3 types	6 types	9 types

Tim has decided to borrow 27 oak barrels from his neighbor - a whisky producer - and will set up these 27 barrels in the plumbing section of the Crazy Tim store. He will use one barrel for each type of tube he identified, and will put the tubes of each type inside the barrel that corresponds to its type.

Based on similar clearance sales that he has conducted in the past, Tim knows that people tend to buy these products speculatively: they do not buy for a reason, but instead out of impulse, just picking randomly from the barrels. This makes the customers equally likely to buy any of the product types offered.

Part 1

The first person to come into the store is Joe. He feels like buying one tube. He is equally likely to pick it from any one of the 27 barrels (i.e. he is equally likely to purchase any type of tube). What is the probability that Joe will purchase one of the Y-shaped types?

Enter your answer as a fraction or in decimal form using three decimal places. For example, if your answer is 23.24%, you should enter .232 in the box below or the respective fraction..

0.222

0.222

Submit You have used 1 of 3 attempts

Correct

Part 2

0 points possible (ungraded)

Another customer, Nancy, has decided to buy two tubes, one first and then the next. For every tube she buys, she is equally likely to pick it from any of the barrels. Even the same barrel that she will use to pick the first tube has the same chance of being chosen as any other barrel at the time she picks the second tube. What is the probability that Nancy will purchase at least one Y-shaped tube? Remember that the store has a whole barrel of each type, so that Nancy can purchase the same type of tube twice.

Enter your answer as an expression or in decimal form using three decimal places. For example, if your answer is 23.24%, you should enter .232 in the box below or the respective expression.

0.395

0.395

Submit You have used 1 of 3 attempts

Correct

Part 3

0 points possible (ungraded)

Ol' Mac, one of Tim's regular customers, also decides to buy two tubes, one first and then the next. For every tube he buys, he is equally likely to pick it from any of the barrels. What is the probability that Ol' Mac will purchase two L-shaped tubes? Remember that the store has a whole barrel of each type, so that a customer can purchase the same type of tube twice.

Enter your answer as an expression with fractions or in decimal form using three decimal places. For example, if your answer is 23.24%, you should enter .232 in the box below or the respective expression..

0.012

0.012

Submit You have used 1 of 3 attempts

Correct

Part 4

0 points possible (ungraded)

The clearance sale has been a huge success, and by the end of the day all the barrels are almost empty: there is only one tube of each type left at the bottom of each one of the 27 oak barrels. At that time, when the store is almost closing, the last customer of the day comes in: Julia, Tim's wife. Julia wants to buy two tubes. Given that she is equally likely to pick any barrel for each choice, what is the probability that Julia will purchase two Y-shaped tubes? Because you only have one of each tube type left on each barrels, Julia cannot purchase the same exact tube type twice. After picking the first tube she wants, that barrel will be empty, and Julia must pick the second tube from the other barrels.

Enter your answer as an expression with fractions or in decimal form using three decimal places. For example, if your answer is 23.24%, you should enter .232 in the box below or the respective expression.

0.043

0.043

Submit You have used 2 of 3 attempts

Correct