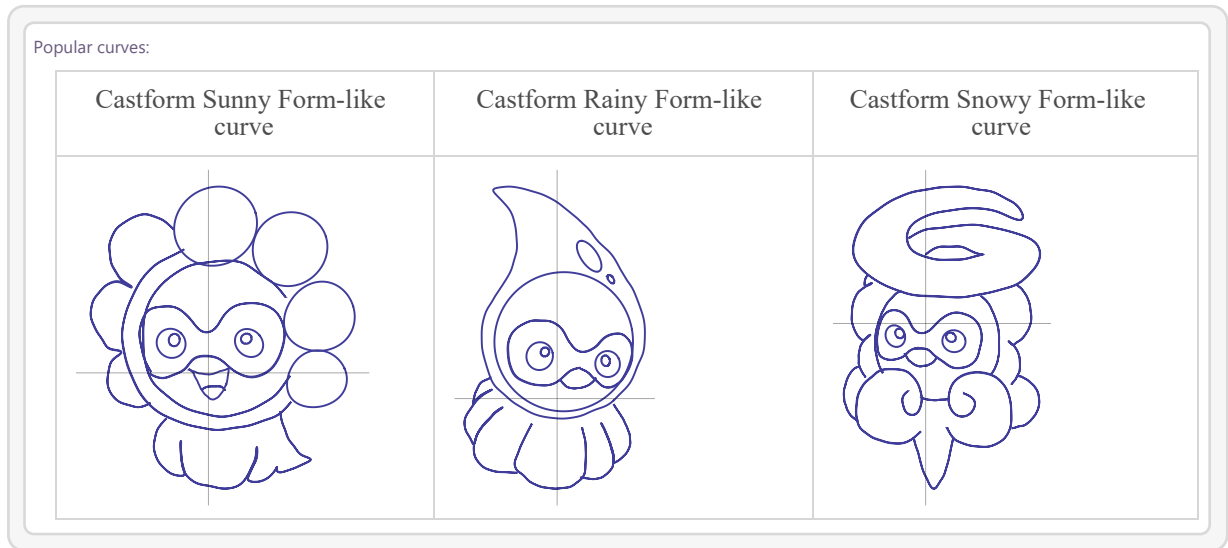


Pokémath: Group Work 7

Name _____



Weather Spawn Rates

The weather in certain areas of the world can change quickly! In Pokémon® GO, the weather changes at the start of each hour depending on the current conditions. Suppose I collect data on the types of Pokémon® that spawn throughout a typical day which changes among sunny hours, rainy hours, and snowy hours. Just like you might do for your project! For simplicity, I will record only the first type of any dual-type Pokémon® as well as the current in-game weather.

Team Cyclone seem to be more active during poor weather, probably to hide their tracks. Let's make sure we understand how that weather affects the probabilities of catching Pokémon®.

From these data, I approximate the following probabilities for type and weather. To clarify, I mean that the probability of a water type spawn **and** sunny weather is 0.07.

	Sunny	Rainy	Snowy	Total
Water	.07	.12	.06	
Grass	.17	.04	.05	.26
Ice	.01	.02	.08	
Other	.15	.11	.12	
Total	.40			

Let's use the following notation for these events:

W: Pokémon® is water type

G: Pokémon® is grass type

I: Pokémon® is Ice type

S: The weather is sunny

R: The weather is rainy

F: The weather is snowy (F for freezing)

Conditional Probability

1) Since I am recording only the first type of any dual-type Pokémon®, can we say the events W, G, and I are independent?

2) a) Write the notation and give the probability that a Pokémon® is Water type **and** it spawned during a sunny hour. (Hint: Don't overthink it! The number is already in the chart somewhere!)

b) Write the notation and give the probability that the Pokémon® spawned during a sunny hour.

c) Write the notation and give the probability that a Pokémon® is Water type **given** it spawned during a sunny hour. Please show your work. (Open the notes and see if you can find the formula that will answer this one!)

3) a) Suppose, I go back out for more catching. Write the notation and give the probability that the weather is snowy.

b) Write the notation and give the probability that the weather is **not** snowy.

c) Write the notation and give the probability that a Pokémon[®] is Ice type **and** it didn't spawn during a snowy hour.

d) Write the notation and give the probability that a Pokémon[®] is ice type **given** it didn't spawn during a snowy hour.

4) a) Write the notation and give the probability that a Pokémon[®] is Grass type **given** that it spawned during a rainy hour.

b) Write the notation and give the probability that a Pokémon[®] is Grass type **given** that it *didn't* spawn during a rainy hour.

5) Let's use Pokémon to predict the weather! **Given** that the Pokémon[®] is grass type, what is the probability it is a sunny hour?

6) Are G and S independent events? Explain in a few sentences why or why not.