Name: Date: Period:

Probability Quiz

_____7.1: Calculate probabilities involving "OR" & "AND" and "NOT" using probability rules and models.
_____7.2: Interpret and calculate probabilities from a table or Venn Diagram

1. The probability of selecting a chocolate from a store is .35. The probability of selecting a lollipop from a store is .25. There are no chocolate lollipops in the store.

   a. Are the events selecting a chocolate and selecting a lollipop mutually exclusive? Explain:

   Yes, they cannot happen at the same time.

   b. Find the probability of selecting a chocolate OR a lollipop. Show your calculation.

   $P(A \text{ or } B) = P(A) + P(B) = .35 + .25 = .60$ or $\boxed{60\%}$

2. 60% of students at MESA think Hilary Clinton would make a good president. 75% of students think that Bernie Sanders would make a good president. 45% of students think that both Clinton AND Sanders would make good presidents.

   a. Are the events "thinking Clinton would be a good president" and "thinking Sanders would be a good president" mutually exclusive? Explain.

   No, they can happen at the same time.

   b. Find the probability that a student selected at random from MESA thinks that Sanders OR Clinton would make a good president.

   $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B) = .75 + .60 - .45 = \boxed{.90}$

   c. Find the probability that a student selected at random from MESA does NOT think that EITHER of them would make a good president.

   $1 - .90 = \boxed{.10}$

3. Use the spinner below to answer the following questions:

   a) Suppose that a person spins the spinner 4 times. Explain why these spins are **independent**.

   One spin does not affect the next spin.

   b) Marlon spins the wheel twice: What is the probability that he spins bankrupt the first time AND the second time?

   $P(A \text{ AND } B) = \dfrac{1}{12} \cdot \dfrac{1}{12} = \dfrac{1}{144} = \boxed{.0069}$

   c) Marlon spins the wheel three times: What is the probability that he gets bankrupt the first time, loses a turn the second time, and gets 250 the third time (hint: there are two spaces with 250)

   $\dfrac{1}{12} \cdot \dfrac{1}{12} \cdot \dfrac{2}{12} = \dfrac{2}{1728} = \boxed{.0012}$

   d) **What is the probability that Marlon gets MORE than 150 four times in a row?**

   $\dfrac{4}{12} \cdot \dfrac{4}{12} \cdot \dfrac{4}{12} \cdot \dfrac{4}{12} = \dfrac{256}{20736} = \boxed{\dfrac{1}{81}}$

4. The table below shows the amount of sleep for workers on the night shift and day shift:

	Sleeps less than 8 hours	Sleeps 8 or more hours	Totals
Night shift	12	58	70
Day shift	14	16	30
Totals	26	74	100

Answer the following based on the table above:

a) What is the probability of a person working on the night shift?

$$\frac{70}{100}$$

b) What is the probability of a person sleeping less than 8 hours?
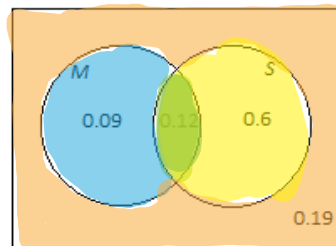
$$\frac{26}{100}$$

c) **GIVEN** that a person works the night shift, what is the probability that they sleep 8 or more hours?

$$\frac{58}{70}$$

d) **GIVEN** that a person sleeps less than 8 hours, what is the probability that they work the day shift?

$$\frac{14}{26}$$

5. The space M below represents the people going to Math Camp. The space S represents the people going to Science Camp.

a) What is the probability that a person goes to Math and Science Camp?

.12

b) What is the probability that a person goes to Math Camp but NOT Science Camp?

.09

c) What is the probability that a person goes to neither Math nor Science Camp?

.19

d) GIVEN that a person goes to science camp, what is the probability that they go to Math camp?

$$\frac{.12}{.72} = .16$$