

Name: Key

Period: _____

Checkpoint 8B

Integrated Math 2

Include all necessary math work or explanations for each question.

- 1) Given that A and B are independent events, what is $P(A \text{ and } B)$ if $P(A) = \frac{1}{2}$ and $P(B) = \frac{2}{7}$?

$$P(A \text{ and } B) = P(A) \cdot P(B) = \frac{1}{2} \cdot \frac{2}{7} = \frac{1 \cdot 2}{2 \cdot 7} = \frac{2}{14} = \boxed{\frac{1}{7}}$$

- 2) Given that A and B are mutually exclusive events, what is $P(A \text{ or } B)$ if $P(A) = 32\%$ and $P(B) = 17\%$?

$$32\% = 0.32$$

$$17\% = 0.17$$

$$P(A \text{ or } B) = P(A) + P(B) = 0.32 + 0.17 = \boxed{0.49} \text{ or } \boxed{49\%}$$

- 3) What is the probability of rolling a 4 on a fair number cube and getting "tails" when tossing a coin?

$$A: \text{rolls } 4 \rightarrow P(A) = \frac{1}{6}$$

$$B: \text{tails} \rightarrow P(B) = \frac{1}{2}$$

$$P(A \text{ and } B) = P(A) \cdot P(B) = \frac{1}{6} \cdot \frac{1}{2} = \boxed{\frac{1}{12}}$$

- 4) At a local high school, 34% of the students take a bus to school and 56% of the students walk to school. What is the probability of randomly selecting a student that takes a bus or walks to school?

A: takes bus

B: walks

$$P(A \text{ or } B) = P(A) + P(B) = 0.34 + 0.56 = \boxed{90\%}$$

* Note: A and B are mutually exclusive

- 5) A survey revealed that 28% of people are entertained by reading books, 37% are entertained by watching movies, and 18% are entertained by both books and movies. What is the probability that a person will be entertained by books or movies?

A: reading books

B: watching movies

$$P(A) = 0.28$$

$$P(B) = 0.37$$

$$P(A \text{ and } B) = 0.18$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$= 0.28 + 0.37 - 0.18$$

$$= \boxed{0.47}$$

- 6) Given a standard deck of 52 cards, what is the probability of choosing a card that is a heart or a king?

See sample space diagram

A: heart B: King

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$= \frac{13}{52} + \frac{4}{52} - \frac{1}{52} = \frac{13+4-1}{52}$$

- 7) A spinner has 8 equal sections 1 to 8. It's spun once and lands on a number. Find the following probabilities:

- a. multiple of 4 or less than 3?

$$A: \text{multiple of } 4 \rightarrow \{4, 8\}$$

$$B: \text{less than } 3 \rightarrow \{1, 2\}$$

$$P(A \text{ or } B) = P(A) + P(B) = \frac{2}{8} + \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$$

- b. even or greater than 4?

$$A: \text{even} \rightarrow \{2, 4, 6, 8\}$$

$$B: \text{greater than } 4 \rightarrow \{5, 6, 7, 8\}$$

2 #'s intersect

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$= \frac{4}{8} + \frac{4}{8} - \frac{2}{8} = \frac{4+4-2}{8} = \frac{6}{8} = \boxed{\frac{3}{4}}$$

Intersection

- 8) A bag contains 4 black marbles, 3 white marbles, and 6 tan marbles. Answer the following questions:

- a. If you choose a marble, put it back, and then choose another marble, what is the probability that the first marble will be black and the second will be tan?

$$4 + 3 + 6 = 13$$

A: black, B: tan

$$P(A \text{ and } B) = P(A) \cdot P(B) = \frac{4}{13} \cdot \frac{6}{13} = \boxed{\frac{24}{169}}$$

- b. If you choose a marble, then another marble *without putting the first one back in the bag*, what is the probability that the first marble will be black and the second will be tan?

$$\frac{4}{13} \cdot \frac{6}{12} = \frac{24}{156} = \boxed{\frac{2}{13}}$$

Use the following information to answer questions 9 and 10.

Mr. Gamboa was shooting free throws in the gym. He shot four free throws a total of 12 times. Using the sample space of possible outcomes listed below, answer each of the following questions. Y=Made, N=Missed.

YYYN	YNYN	YYYY	NNNY
NNNY	NNNN	YYYY	NNNY
NYYY	NNYN	YYYN	NYYN

- 9) Determine the probability he made the 2nd shot.

$$P(\text{made 2nd shot}) = \frac{6}{12} = \boxed{\frac{1}{2}}$$

- 10) Determine the probability that he missed the 1st shot and the 3rd shot.

$$P(\text{missed 1st and missed 3rd}) = \frac{4}{12} = \boxed{\frac{1}{3}}$$

look at how many "OΔ" we have; there are 4.

Use the spinner to answer questions 11 through 14.

Vowels: A, E, I, O, U

- 11) What is the probability of the arrow stopping on a consonant or one of the first 4 letters of the alphabet?

A: consonant $\rightarrow \{X, J, F, C\}$ \rightarrow Intersection $P(A \text{ or } B)$
 B: one of 1st 4 letters of alphabet $\rightarrow \{A, B, C, D\}$
 $= P(A) + P(B) - P(A \text{ and } B)$
 $= \frac{4}{6} + \frac{2}{6} - \frac{1}{6} = \boxed{\frac{5}{6}}$
 (spinner only has {A, C})

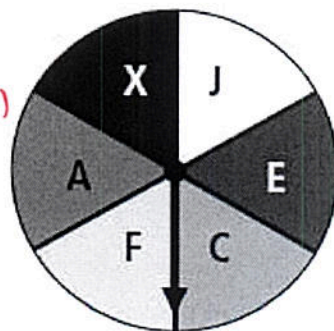
- 12) What is the probability of the arrow stopping on "X" on the first spin and "F" on the second spin?

$$P(X) = \frac{1}{6}$$

$$P(F) = \frac{1}{6}$$

$$P(A \text{ and } F) = P(A) \cdot P(F)$$

$$= \frac{1}{6} \cdot \frac{1}{6} = \boxed{\frac{1}{36}}$$



- 13) What is the probability of the arrow stopping on "J" or "A" on one spin?

$$P(J) = \frac{1}{6}$$

$$P(A) = \frac{1}{6}$$

$$P(J \text{ or } A) = P(A) + P(J)$$

$$= \frac{1}{6} + \frac{1}{6}$$

$$= \frac{2}{6} = \boxed{\frac{1}{3}}$$

- 14) What is the probability of the arrow stopping on "J" and "A" on one spin? Explain.

$\boxed{0}$ b/c it's impossible for spinner to land on both #s.