

MIXED REVIEW of Problem Solving



Make sense of problems and persevere in solving them.

1. **MULTI-STEP PROBLEM** You and a friend are playing a word game that involves lettered tiles. The distribution of letters is shown below.

A 9	H 2	O 8	V 2
B 2	I 9	P 2	W 2
C 2	J 1	Q 1	X 1
D 4	K 1	R 6	Y 2
E 12	L 4	S 4	Z 1
F 2	M 2	T 6	Blank 2
G 3	N 6	U 4	

- You randomly draw 1 tile. What is the probability of getting a vowel? (Assume that Y is a consonant.)
 - You randomly draw 2 tiles without replacement. What is the probability of getting 2 vowels?
 - At the start of the game, you randomly choose 7 tiles without replacement. What is the probability that all of the tiles are vowels?
2. **SHORT RESPONSE** A manufacturer makes briefcases with numbered locks. The locks can be set so that any one of 1000 different codes will open the briefcase. Four friends have briefcases from this manufacturer. What is the probability that at least 2 of the 4 briefcases have the same code? If two more friends buy the same briefcase, how does the probability that at least 2 of the briefcases have the same code change?
3. **OPEN-ENDED** Write a real-life problem that you can solve using a tree diagram and conditional probabilities. Draw the tree diagram and show how to solve the problem.

4. **EXTENDED RESPONSE** The owner of a lawn mowing business owns three old and unreliable riding mowers. As long as one of the mowers is working, the owner can stay productive. From past experience, one of the mowers is unusable 10% of the time, one is unusable 8% of the time, and one is unusable 18% of the time.
- Find the probability that all three mowers are unusable on a given day.
 - Find the probability that at least one of the mowers is usable on a given day.
 - Suppose the least reliable mower stops working completely. How does this affect the probability that the lawn mowing business can be productive on a given day?
5. **SHORT RESPONSE** In the United States there are 21 states (not including Washington, D.C.) with teams in the National Football League and 17 states with Major League Baseball teams. There are 15 states that have both types of teams. Suppose a state is chosen at random.
- Find the probability that the state has either a National Football League team or a Major League Baseball team.
 - There are 21 states that have a team in the National Basketball Association. What additional information would you need in order to find the probability that the state chosen at random has either a team in the National Basketball Association or a Major League Baseball team? *Explain* your reasoning.