

Courtney's Collection

Level A

Courtney has a bank of pennies, nickels, and dimes. Courtney pulled out three coins from the bank. Name three coins she could have picked. How much money does she have?

Show how you figured it out.

Show a different way that Courtney could pick three coins. How much does Courtney have now? Show how you figured it out.

Courtney's Collection

Level B

Courtney has a bank of pennies, nickels, and dimes. How many different ways can Courtney pick three coins out of her bank? Show all the ways you can find.

What are the different amounts of money Courtney would have by picking any three coins?

How do you know you found all the possible ways?

Explain your answer.

Courtney's Collection

Level C

Courtney visited her grandmother. Her grandmother used to collect stamps. She had a shoebox full of 5 cent, 6 cent, and 7 cent stamps. Courtney thought, "I could mail a lot of different-sized letters and postcards with these stamps." She tried to figure out the different amounts of postage she could make with a combination of those stamps. What totals could she make using no more than three stamps, and what totals are impossible?

Explain how you found your solution. How do you know your solution is correct?

Courtney's Collection

Level D

Courtney's grandmother said, "Your grandpa has different shoeboxes with other stamps. One of his shoeboxes has just 4 cent, 6 cent, and 8 cent stamps. Which totals can you make with these stamps?"

Courtney said, "I wonder why there is a difference between the totals I can make based on the types of stamps in each box. I like finding all of the combinations I can make, but with Grandpa's box, I can make totals of any even number except 2. That means there are certain totals I cannot make, no matter how I combine the stamps. I wonder if this is true for some sets of stamps and not for others?" She continued, "I am going to investigate which three stamp amounts have totals that are impossible while others don't. I am going to compare three different sets. I will try 6 cents, 7 cents, and 8 cents. Then I will try 6 cents, 9 cents, and 12 cents. Finally, I will try 6 cents, 8 cents, and 9 cents."

Explain whether the three different sets of stamps have a finite or infinite set of totals that are impossible to make. What is it about the sets of values that distinguishes them in this way?

Courtney's Collection

Level E

Determine a method for predicting whether a given set of any three positive integers has an infinite number of impossible sums when using any combinations of the three numbers or their multiples. Justify your method using mathematical reasoning.

