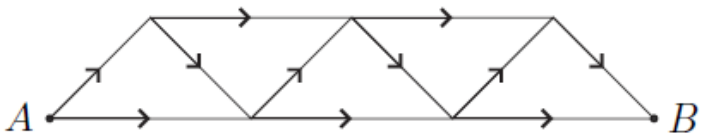
Name:

Math Count Worksheet: Counting and Arrangements

2. Richie has one penny, two nickels, and three dimes. How many different amounts of money can he make using one or more of these six coins?

3. The diagram shows a network of one-way streets. How many ways are there to get from A to B if you can only travel in the direction of the arrows?

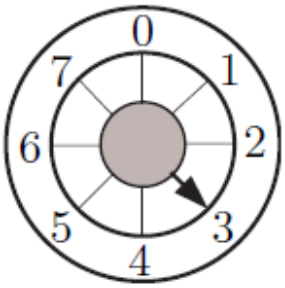


4. How many 3-letter "words" can be made using letters chosen from the letters in "CANADA"? For example, "ADN" is an acceptable word, as are "AAA" and "DAA". But "NCC" is not acceptable, since it has two C's while "CANADA" has only one.

5. Alicia has 6 pairs of shoes, identical except for colour: 3 of the pairs (6 shoes) are brown, 2 pairs are red, and 1 pair is green. Alicia is completely colour blind, so she picks a left shoe and a right shoe at random. What is the probability that the two shoes are of the same colour? Express your answer as a common fraction.

6. How many 3-digit numbers have digit sum equal to 24?

7. A combination for a simple bicycle lock is a sequence (a, b, c), where a, b, and c can be any of 0, 1, 2, 3, 4, 5, 6, or 7, but *adjacent* numbers in the combination are different. For example $(5, 0, 7)$ is a legitimate combination, as is $(5, 0, 5)$, but $(2, 4, 4)$ is not allowed. How many combinations (combos) are possible, altogether?



8. In a school cafeteria, there are 2 different soups, 3 different main courses, and 3 different desserts. You are allowed to take at most one soup, at most one main course, and up to three desserts (but you cannot have two or more servings of the *same* dessert). How many different meals could you have? Include in your count the "meal" in which you eat nothing.

9. How many strictly increasing sequences of positive integers begin with 1 and end with 7? Two such sequences are 1, 7 and 1, 4, 6, 7.

13. What is the value of $\dfrac{8!}{4!4!}$?

16. How many three-digit numbers are there such that the three digits are not all the same?