

Counting Worksheet 2 (order might not matter)

1. On a 12-person basketball team, how many ways are there to create a 5-person group of starters?

2. This problem concerns the Colorado lottery.
 - (a) In the Colorado lottery (lotto), there are 42 ping-pong balls, numbered from 1 to 42. In a random drawing, 6 of the balls are chosen. How many possible outcomes are there?

 - (b) If you choose your numbers randomly each time, and play 100 times in a year, what are your chances of winning the lotto three times?

 - (c) Now suppose you choose the same numbers each time. How does this affect your chances?

3. A set X has 35 four-element subsets. What is $|X|$?

4. There are 10 people standing in line, including Joe and Jane. In how many of the possible arrangements of people in the line is Jane ahead of Joe?

5. How many 5-digit postal-codes have exactly 3 zeroes?

6. Use the binomial theorem to expand $(x - 2y)^5$.
7. What is the coefficient of x^7y^3 in the expansion of $(x + y)^{10}$?
8. What is the coefficient of x^6 in the expansion of $(x + 1)^9$?
9. What is the coefficient of x^6 in the expansion of $(x - 3)^9$?
10. Find a formula for the sum of the numbers in row n of Pascal's triangle and explain why your formula is correct.
11. At a car repair shop, 40% of the repairs are on time, 50% of the repairs are acceptable, and 25% of the repairs are neither on time nor acceptable. What percentage of the repairs are on time and acceptable?
12. How many integers from 1 to 1000 (inclusive) are a multiple of 2 or a multiple of 5?
13. We have 7 balls, each of a different color, that we are placing in 3 different boxes, each of a different size. How many ways are there to do this so that none of the boxes are empty?