COUNTING

AUXILIARY TEXT: 7.1, 7.2, 7.3

LAST NAME	FIRST NAME	DATE

1 (4 points). Compute the values of these expressions!

$6!$ $(20-16)!$

$\dfrac{7!}{2!(7-2)!}$ $\dfrac{500!}{(500-2)!}$

2 (1 point). Alice can choose to wear one pair of jeans out of three, one top out of four, and one scarf out of ten. How many different outfits can Alice create?

3 (1 point). Sean wants to borrow 6 of Morgan's books, but Morgan will only give him two books at a time. In how many ways can Sean choose which two books to borrow?

4 (1 point). Derek has 420 tracks in his Reggae collection. He wants to make a playlist without repetitions. How many distinct 3-track playlists can he make if the order of songs is important to him?

5 (1 point). ACME Space Corp needs to choose 3 astronauts out of the pool of 7 qualified candidates, where 5 of the candidates are pilots and the other 2 are scientists. If all choices are equally likely, what are the chances that all of the chosen individuals are pilots?

6 (2 points)**.** A basket contains 50 green apples and 40 red apples. Shawneese picks 10 apples without looking.

(a) What is the probability Shawneese picks 10 green apples?

(b) What is the probability Shawneese picks 5 green and 5 red apples?

7 (4 points)**.** A state license plate consists of 5 characters. Each character can be either an Arabic digit or a capital English letter (so there are 10 digits and 26 letters). Use the counting techniques to answer the following quesations. State your answers as decimals.

(a) Find the number of distinct license plates.

(b) What are the chances a random license plate starts with the word CAT?

(c) What are the chances a random license plate does not contain the letter Z?

(d) What are the chances a random license plate does not contain the letter Z, given that it consists entirely of letters?

8 (1 point)**.** Harry sets a random four-digit PIN on his bank account. If all PINs are equally likely, what are the chances that at least two digits in Harry's PIN are the same?