

## 10.12 - Counting problem examples

Thursday, July 20, 2023 10:16 PM



### EXERCISE

#### 10.12.1: Ordering soda at a grocery store.



An employee of a grocery store is placing an order for soda. There are 8 varieties of soda and they are sold in cases. Each case contains all the same variety. The store will order 50 cases total.

- (a) How many ways are there to place the order?
- (b) How many ways are there to place the order if she does not order more than 20 of any single variety?

[Feedback?](#)

$$(a) \quad \binom{50+8-1}{8-1} = \binom{57}{7} = \frac{57!}{7!(57-7)!} = 264,385,836 \text{ ways}$$

$$(b) \quad 1 \cdot \binom{8+50}{50} + 8 \cdot \binom{8+29}{29} + 28 \cdot \binom{8+8}{8} = 2,226,021,831 \text{ ways}$$