

When it makes sense to do so, answer ‘C’ for “The numbers are equal” and ‘D’ for “The answer depends on the parameters”. You will receive 1/4 point for any question on which you answer ‘E’ for “I don’t know”.

Problem 1. Which of the following numbers is \geq the other?

- A) The number of ways of selecting k objects from a pool of n objects, without repetition.
- B) The number of ways of selecting k objects from a pool of n objects, with repetition allowed.

Solution. B)

Problem 2. Which number is \geq the other?

- A) n^n
- B) $n!$

Solution. A)

Problem 3. Which of these numbers is the same as $(n)_k$?

- A) $\frac{n!}{k!}$
- B) $\prod_{\ell=0}^{k-1} (n - \ell)$

- C) Both
- D) Neither

Solution. B)

Problem 4. Which number is largest?

- A) 2^n
- B) $n!$

Solution. D)

Problem 5. The value of $0!$ is

- A) 0
- B) 1
- C) ∞
- D) not defined.

Solution. B)

Problem 6. The equation $(n + 1)n! = (n + 1)!$ holds for any non-negative integer n .

- A) True
- B) False

Solution. A)