

Factorial Notation

n-Factorial: the product of the positive integer n and all the positive integers less than n .

For any natural number n ,

$$n! = n(n-1)(n-2)\dots(3) \cdot (2) \cdot (1).$$

For the number 0,

$$0! = 1.$$

Practice Exercises

A. Evaluate.

1. $\frac{6!}{4! + 5!}$

3. $\frac{9! - 4!}{7! - 5!}$

5. $\frac{6!}{4!3!}$

B. Simplify by factorization.

1. $\frac{7! - 6!}{6}$

3. $\frac{6! + 4!}{31}$

5. $\frac{7! + 6! - 5!}{5!}$

2. $\frac{7! - 6!}{6!}$

4. $\frac{8! - 6!}{55}$

C. Simplify the following.

1. $\frac{n!}{n}$

3. $\frac{(n+2)!}{n!}$

5. $\frac{(n+1)! + n! - (n-1)!}{(n-1)!}$

2. $\frac{(n+1)!}{n!}$

4. $\frac{(n+1)!}{(n-1)!}$

Problem Set

A. Evaluate.

1. $\frac{7!}{3! + 5!}$

3. $\frac{8! - 6!}{9! - 3!}$

5. $\frac{8!}{5!4!}$

B. Simplify by factorization.

1. $\frac{6! - 5!}{5}$

3. $\frac{7! + 5!}{60}$

5. $\frac{6! + 5! - 4!}{4!}$

2. $\frac{8! - 7!}{7!}$

4. $\frac{9! - 5!}{24}$

C. Simplify the following.

1. $\frac{n!}{(n-1)!}$

3. $\frac{(n+2)!}{(n+1)!}$

5. $\frac{(n+1)! - n! + (n-1)!}{(n-1)!}$

2. $\frac{(n-1)!}{n!}$

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