

Factorials! (Assignment 46)

Evaluate each expression. Simplify before using a calculator.

1. $3!$

2. $5!$

3. $10!$

4. $\frac{7!}{6!}$

5. $\frac{10! \cdot 2}{8!}$

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

7. $\frac{19!}{13!}$

8. $\frac{155!}{153!}$

9. $\frac{21!}{19! \cdot 2!}$

10. $\frac{100!}{98!}$

11. $\frac{11!}{7!}$

12. $\frac{8!}{3!}$

Write each expression in its simplest form. You do not need to calculate anything.

13. $9! \cdot 10 \cdot 11$

14. $204 \cdot 202! \cdot 203 \cdot 205$

15. $n!(n + 1)$

16. $(n - 1)(n - 2)!$

17. $(m - 1)!(m^2 + m)$

18. $(q + 5)(q + 6)(q + 4)!$

19. $\frac{(m+1)!}{m!}$

20. $q!(q^3 + 3q^2 + 2q)$

Write each answer in factorial form, then calculate the exact answer, if possible.

21. Five sprinters are running in a 100 meter race. In how many different ways could first, second, and third place be awarded?

22. In how many different ways could the letters of the word KITE be permuted?

23. A gardener has m unique flowers. There is space along the side of his house to plant k of them in a line. In how many ways could he plant his flowers?

24. There are $2n$ kindergarteners in a classroom. The teacher wants to line up half of the class at the door to go to the lunch. In how many ways can she create this line?

25. How many ways could a class president and a class vice president be chose from a group of n students?

26. You have six errands to run this Saturday but you will only have time to complete four of them. In how many different orders could you choose four errands out of the six on your list?

27. How many different 5 letter words (including nonsense words) can be created from the English alphabet if the same letter cannot be used twice?