Try these problems before watching the lesson.

1. What is the value of $\frac{5! \cdot 2!}{3!}$?

2. Simplify: $\frac{18!}{16!}$.

3. For what value of $n$ does $\frac{10!}{7! \cdot 3!} = n!$?

4. Compute: $\frac{6! + 5!}{5!}$.

First Problem: What value of $n$ satisfies $(n + 1)! - n! = 4320$?

Second Problem: What is the greatest integer $p$ such that $33!$ has $3p$ as a factor?

Third Problem: What is the value of $\frac{5! + 6!}{4! + 3!}$?

Follow-up Problems

5. What is the value of $\frac{8! + 9!}{7! + 8!}$? Express your answer as a common fraction.

6. What is the greatest perfect square that is a factor of $7!$?

7. Given that $10^k$ is a factor of $25!$, what is the greatest possible value of $k$?

8. If the sum of $1! + 2! + 3! + \cdots + 49! + 50!$ is divided by 15, what is the remainder?
Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).