



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  $3^p$  as a factor?

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



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?

 *Share Your Thoughts*

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](http://www.artofproblemsolving.com)).