## Competitive Math Assessment - Factorization Practice Quiz \#2

Here are some suggestions for how to practice replicating testing conditions:

- Make sure you have a quiet place to practice on your own for an extended period of time. This will help model the actual experience of a competition. When you have finished the quiz, check your solutions using the online Brilliant quiz.
- Set a timer, or at least keep an eye on the clock to learn your own pace. If you want to set a specific time goal, math competitions provide an average of about 2 minutes per problem, so you should give yourself 30-40 minutes to complete these problems. Keep in mind that the general difficulty of problems increases as you move forward.
- Some competitions allow students to use calculators while others do not. We encourage you to use a calculator only for the most in-depth calculations on this practice quiz.

1. $\qquad$
2. $\qquad$ Find the value of $E$.


Evaluate

$$
\frac{16!}{11!8!} .
$$

4. $\qquad$ How many odd factors does 1260 have?
5. $\qquad$ How many numbers between 1 and 1000 inclusive are divisible by 6 or 20?
6. $\qquad$ If $x<270$ and $\operatorname{gcd}(x, 270)$ is a perfect square, what is the largest possible value of $x$ ?
7. $\qquad$ Evaluate

$$
\frac{9!+8!}{7!+6!}
$$

8. $\qquad$ What is the product of all the factors of $126 ?$
A. $126^{3}$
B. $126^{6}$
C. $126^{9}$
D. $126^{12}$
9. $\qquad$ If each letter represents a different integer, find the value of the 2-digit integer $Q R$.

10. $\qquad$ What is the largest number $x$ such that $x<200$ and $x$ has exactly 4 factors?
11. $\qquad$ Miranda is an avid collector of stamps. She is trying to arrange her collection of stamps into neat rows. She found that when she arranged them in rows of $2,3,4,5,6$, or 7 , she always came up 1 short.

What is the minimum number of stamps that Miranda has?
A. 319
B. 359
C. 419
D. 719
12. $\qquad$ How many positive integers $a$ are there such that 2027 divided by $a$ leaves a remainder of 7 ?
13. $\qquad$ What is the largest perfect cube that is a factor of 10 !?

If each letter represents a different digit from 1 to 9 , find the value of $L$.

15. $\qquad$ How many ordered pairs of positive integers ( $m, n$ ) satisfy

$$
\begin{gathered}
\operatorname{gcd}\left(m^{3}, n^{2}\right)=2^{2} \cdot 3^{2} \\
\text { and } \\
\operatorname{lcm}\left(m^{2}, n^{3}\right)=2^{4} \cdot 3^{4} \cdot 5^{6} ?
\end{gathered}
$$

