



Competitive Math Assessment - Efficiency 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.
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1. _____

Evaluate:

$$10 - 3 \times 2 + 6 \div 3 - 2.$$

2. _____

If each letter represents a different nonzero digit, what must Z be?

$$\begin{array}{r} X X \\ + Y Y \\ \hline X Y Z \end{array}$$

A. 6

B. 7

C. 8

D. 9

3. _____

If $a \diamond b = 3b - 2a$, what is the value of $3 \diamond (5 \diamond 4)$?

4. _____

Evaluate

$$\sqrt{(-4)^6}.$$

5. _____

What is the value of the sum $4 + 8 + 12 + \dots + 32 + 36 + 40$?

6. _____

Six out of the seven \square s below contain addition signs, and the remaining \square contains a subtraction sign.

Where should the subtraction sign go to make the equation true?

$$1 \square 2 \square 3 \square 4 \square 5 \square 6 \square 7 \square 8 = 30$$

A. Between the 1 and 2

B. Between the 2 and 3

C. Between the 3 and 4

D. Between the 4 and 5

E. Between the 5 and 6

F. Between the 6 and 7

G. Between the 7 and 8

7. _____

Which value is equivalent to $\sqrt{8 \times 9 \times 10}$?

A. $10\sqrt{3}$

B. $10\sqrt{5}$

C. $12\sqrt{2}$

D. $12\sqrt{5}$

8. _____

If $\frac{(a^5b^2)^3}{(a^2b^3)^4} = \frac{a^m}{b^n}$, where m and n are positive integers, then what is $m + n$?

9. _____

Is it possible to fill each square in with an arithmetic operation (+, −, ×, ÷), so that this becomes a true equation?

$$10 \square 10 \square 10 \square 10 = 101$$

10. _____

If each letter represents a different nonzero digit, what must S be?

$$\begin{array}{r} + \quad \quad S \quad E \quad E \\ \quad \quad E \quad Y \quad E \\ \hline \quad \quad Y \quad E \quad S \end{array}$$

A. 2

B. 4

C. 6

D. 8

11. _____

Evaluate

$$\frac{(2^4)^8}{(4^8)^2}$$

12. _____

Which of the following is a perfect square?

A. $2^2 \times 4^3 \times 8^4$

B. $2^3 \times 4^2 \times 8^4$

C. $2^4 \times 4^2 \times 8^3$

D. $2^2 \times 4^4 \times 8^3$

13. _____

If each letter represents a different nonzero digit, what must D be?

$$\begin{array}{r} H A D \\ + \quad H A \\ \hline A H A \end{array}$$

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

14. _____

The product of two consecutive numbers is 812. What is the larger of the two numbers?

15. _____

Find the largest integer n that satisfies the inequality below.

$$n^{200} < 5^{300}$$