

Choose the letter that justifies each step in the proof below:

- | | |
|---|--------------------------|
| ___ Let N be a four digit number such that $N = abcd$. | A. Given |
| ___ $N = a \cdot 1000 + b \cdot 100 + c \cdot 10 + d$ | B. Decomposition |
| ___ $N = a(999 + 1) + b(99 + 1) + c(9 + 1) + d$ | C. Commutative Property |
| ___ $N = 999a + a + 99b + b + 9c + c + d$ | D. Decomposition |
| ___ $N = 999a + 99b + 9c + a + b + c + d$ | E. Distributive Property |
| ___ $N = 9(111a) + 9(11ab) + 9(1c) + (a + b + c + d)$ | F. Expanded Notation |

Scoring:

- 2 points: All five letters placed correctly.
 1 point: Four letters placed correctly.
 0 points: Less than four letters placed correctly.

Key and Distractor Analysis:

- A. This is the given definition.
 F. This is the four digit number written in expanded notation.
 B or D. This is decomposing each of the powers of ten.
 E. This is using the distributive property of multiplication over addition.
 C. This is using the commutative property of addition.
 B or D. This is decomposing each of the coefficients greater than 1 into two factors, one of which is nine.

Expressions and Equations

7.EE

Use properties of operations to generate equivalent expressions.

1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.