ProofSpace Comprehension Quiz

Sets

Introduction

Let $A = \{2, 3, \{2\}, \mathbb{Z}\}$ and $B = \{\emptyset, \{\mathbb{Z}\}, 4\}$.

1 For each of the following, write "A" if it is an element of A, "B" if it is an element of B, "Both" if it is an element of both, and "Neither" if it is an element of neither.

a) 2

b) 4

c) $\{2\}$

d) -1

e) $\{1\}$

f) $\emptyset$

g) $\{\emptyset\}$

h) $\mathbb{Z}$

i) $\{\mathbb{Z}\}$

2 For each of the following, write "A" if it is a subset of A, "B" if it is a subset of B, "Both" if it is a subset of both, and "Neither" if it is a subset of neither.

a) $\{4\}$

b) $\{\emptyset, 2\}$

c) $\{2\}$

d) $\{2, \{2\}\}$

e) $\{1\}$

f) $\emptyset$

g) $\{\emptyset\}$

h) $\mathbb{Z}$

i) $\{\mathbb{Z}\}$

3 Write out each of the following sets in *list format*.

a) $\mathcal{P}(A)$.

b) $\mathcal{P}(B)$.

4 Determine if each of the following statements are true or false.

a) $\{3\} = \{\{3\}\}$

b) $\{3, \{3\}\} = \{3\}$

c) $\{3, \{3\}\} = \{\{3\}\}$

d) $\{3, 3, 3, 3, \{3\}, \{3\}\} = \{3, \{3\}\}$

e) 3 is an element of $\{\{3\}\}$

f) $\{3\}$ is an element of $\{\{3\}\}$

g) $\{\{3\}\}$ is an element of $\{\{3\}\}$

h) 3 is a subset of $\{\{3\}\}$

i) $\{3\}$ is a subset of $\{\{3\}\}$

j) $\{\{3\}\}$ is a subset of $\{\{3\}\}$