



EXERCISES: Set Relation

1. Let

$$A = \{d, a, y, s\},$$

$$B = \{g, o, n, e\},$$

$$C = \{b, o, y\},$$

$$D = \{n, e, o, g\}$$

Compare the sets, using the terms: a) equal and equivalent; b) joint and disjoint

- a) Sets A and B
- b) Sets A and C
- c) Sets A and D
- d) Sets B and C
- e) Sets B and D
- f) Sets C and D

2. TRUE or FALSE. If FALSE, explain why.

- a) All equivalent sets are equal. i) $\{4\} \subseteq \{3, 4, 5\}$
- b) All equal sets are equivalent. j) $5 \in \{\{3\}, \{4\}, \{5\}\}$
- c) All empty sets are equal. k) $\{3\} \subseteq \{3, 4, 5\}$
- d) All empty sets are equivalent. l) $3 \subseteq \{3, 4, 5\}$
- e) $\{ \}$ is an empty set. m) $\{ \} \subseteq \{3, 4, 5\}$
- f) $\{0\}$ is an empty set. n) $\{c, a, t, s\} = \{a, c, t, s\}$
- g) A null set is a finite set. o) $3 \in \{3, 4, 5\}$
- h) If $B = \{b \mid b \text{ is a whole number less than } 10\}$, then $n(B) = 9$

3. Which of the following statements are true?

Given: $M = \{0, 2, 4, 6, 8\}$

- a) $0 \in M$ f) $\{0, 2\} \subset M$
- b) $4 \subseteq M$ g) $0 \subseteq M$

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| c) $M \subseteq M$ | h) $\emptyset \subseteq M$ |
| d) $\emptyset \in M$ | i) $6, 8 \subseteq M$ |
| e) $\{0\} \subseteq M$ | j) $M \subset M$ |

4. A set contains 50 elements.
- How many subsets does it contain?
 - How many proper subsets does it contain?
5. List all the subsets of:
- $W = \{w \mid w \text{ is a whole number less than } 3\}$
 - $C = \{c \mid c \text{ is a counting number less than } 3\}$
 - $O = \{o \mid o \text{ is an odd factor of } 12\}$
 - $E = \{e \mid e \text{ is an even factor of } 10\}$
 - $F = \{f \mid f \text{ is a factor of } 8\}$
6. Rewrite the following statements using mathematical symbols.
- A is not equal to the set whose elements are 1, 2, 3, and 4.
 - S is not an element of set R.
 - The set consisting of the elements q, r, and s is a proper subset of the set consisting of elements p, q, r, s, and t.
 - 0 is not an element of the empty set.
 - The set whose only element is 0 is not equal to the empty set.