

Use your knowledge of Sets and Set Theory to answer each question below.

- In each problem, indicate set equality by writing = or \neq .
 - $A = \{0, 2, 4, 6, 8, 10, 12\} \neq B = \{t, r, i, a, n, g, l, e\}$
 - $C = \{a, e, i, o, u\} = D = \{\text{vowels}\}$
 - $X = \{\text{whole numbers} \leq 9\} \neq Y = \{8, 4, 5, 7, 2, 0, 6, 3, 1\}$
 - $P = \{\text{fingers}\} = Q = \{\text{thumb, index, middle, ring, little}\}$

- In each problem, indicate whether one set is a subset of the other by writing the symbols \subset or $\not\subset$.
 - $A = \{0, 2, 4, 6, 8, 10, 12\} \not\subset B = \{\text{even numbers between 0 and 20}\}$
 - $M = \{\text{consonants}\} \not\subset N = \{a, b, c, d, e\}$
 - $X = \{\text{whole numbers} < 7\} \subset Y = \{8, 4, 9, 5, 7, 2, 0, 6, 3, 1\}$
 - $C = \{a, e, i, o, u\} \subset D = \{\text{The English alphabet}\}$
 - $R = \{e, a, r\} \not\subset S = \{c, a, r, d\}$
 - $F = \{-4, -3, -2, -1, 0, 1\} \subset G = \{\text{integers} < 7\}$
 - $P = \{\text{Saturday, Sunday}\} \not\subset Q = \{\text{Wednesday, Thursday, Friday, Saturday}\}$

- Create an example of two sets in which the first set is a subset of the second.

Sample answer 1: $\{\text{consonants}\} \subset \{\text{The English alphabet}\}$
 Sample answer 2: $\{\} \subset \{\text{integers}\}$

- Create an example of two sets in which the first set is not a subset of the second.

Sample answer 1: $\{e, a, r, s\} \not\subset \{l, e, a, r, n\}$
 Sample answer 2: $\{1, 3, 5, 7, 9\} \not\subset \{\text{even whole numbers}\}$

- How many subsets does each set have? Show your work.
 - $X = \{0, 2, 4, 6\} \quad n = 4; 2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$
 - $Q = \{\text{fingers}\} \quad n = 5; 2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$
 - $P = \{\text{primary colors}\} \quad n = 3; 2^3 = 2 \cdot 2 \cdot 2 = 8$