socrative
by MasteryConnect

Name: _____   **Date:** _____

Quiz name: Discrete Math Apr 6 (cardinality)

---

1. What is the cardinality of P, the set of all primes?

    (A) It is a large finite number. The number is greater than 10^{61}.

    ● $|P|=|Z|$, which is countably infinite. This is because the primes can be listed.

    (C) $|P|$ is 0, because the proportion of primes in the first n numbers approaches 0 as n goes to infinity, just like perfect squares.

    (D) $|P|=|R|$, which is uncountable, because there is no formula for the nth prime.

---

2. Suppose R is the relation {(x,x),(x,y),(y,y),(y,x),(z,z)} on the set S={x,y,z}. What is the cardinality of the quotient space S/R?

    (A) 5, the number of elements in R

    (B) 3, the number of elements in S that are present in the relation

    (C) 1, because x, y, and z are all identified by R

    ● 2, the number of blocks in S after elements are glued together by identifying a and b iff aRb

---

3. Recall that floor(x) denotes the largest integer that is less than or equal to x. Define an equivalence relation on C, the set of circles in the plane, by $C_1 \sim C_2$ iff floor(radius$_1$)=floor(radius$_2$). What is the cardinality of the set of classes of circles?

    (A) Finite.

    ● Countably infinite.

    (C) Uncountable.

    (D) Undefined.