

Name: _____

- Complete this quiz without any aids, including the text or your peers.
- You may leave your answers unsimplified.

Let $A = \{1, 2, \dots, 10\}$ and $B = \{1, 2, \dots, 15\}$.

- (1) How many relations from
- A
- to
- B
- are there?

A relation is a subset of $A \times B$,

so $|\mathcal{P}(A \times B)| = 2^{|A \times B|} = 2^{|A||B|} = 2^{10 \cdot 15}$.

- (2) How many functions from
- A
- to
- B
- are there?

15^{10}

- (3) How many functions from
- A
- to
- B
- are injective?

$P(15, 10)$

- (4) How many functions from
- A
- to
- B
- are not injective?

$15^{10} - P(15, 10)$

- (5) How many functions from
- B
- to
- A
- are there?

10^{15}

- (6) How many functions from
- B
- to
- A
- are injective?

0

- (7) How many functions from
- B
- to
- A
- have a range with exactly 2 elements?

$\binom{10}{2} [2^{15} - 2]$