

Quiz 2

October 22

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1. Consider the following two sets:

$$\begin{aligned} A &= \{x \mid x \text{ is an integer multiple of 3 and } 1 \leq x \leq 1200\} \\ B &= \{x \mid x \text{ is an integer multiple of 4 and } 1 \leq x \leq 1200\} \end{aligned}$$

(a) (1 Point) What is $|A|$?

(b) (1 Point) What is $|A \cap B|$?

(c) (2 Points) What is $|A \cup B|$?

2. A coach is trying to decide his starters for a basketball team. There are five distinct positions: point guard, shooting guard, center, power forward, and small forward.

(a) (2 Points) How many ways are there to choose the starters if any of the eleven players on the team can play any of the positions?

(b) (2 Points) How many ways are there to choose the starters if there are four players on the team who can play either of the forward positions, 2 players who could play center, and five players who could play either of the guard positions?

3. (2 Points) How many babies must be born in a single day to guarantee that there are at least two babies born at exactly the same time, down to the second? You can leave your answer in the form of an arithmetic expression (e.g. $57 \cdot 34 + 6$).