Pigeonhole Principle

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Pigeonhole Principle

- The pigeonhole principle, also known as Dirichlet Box Principle or Dirichlet Drawer Principle, states that if $n + 1$ or more pigeons are placed in n holes, then one hole must contain two or more pigeons.

n m $n > m$

Generalized Pigeonhole Principle

- The extended version of this states that if k objects are placed in n boxes then at least one box contain at least $\lceil \frac{k}{n} \rceil$ objects.

Examples

- Assume a drawer contains an infinite mixture of black, blue and brown socks, each of which can be worn on either foot and that you are pulling a number of socks from the drawer without looking.

What is the minimum number of socks required to be pulled to guarantee a pair of the same colour?

Examples (Cont..)

- In any group of 27 English letter words, at least how many must be there that begin with the same letter?

- How many students must be in a class to guarantee that at least two students receive the same score in the final exam, if the exam is graded on a scale from 0 to 100 points?


Thank
you !!!
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