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Pigeonhole Principle

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Principle Problems (Part

1: Pair of numbers

which sum to 12)

*Pigeonhole principle*

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*explained with examples  
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generalized pigeonhole  
principle examples |  
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Permutations and

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Application of

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*Pigeonhole Principle*

Pigeonhole Principle

Problems And Solutions

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Pigeonhole Principle  
example question. a)  
Show that if five  
integers are selected  
from the first eight  
positive integers, there  
must be a pair of these  
integers with a sum  
equal to 9. b) Is the  
conclusion in part (a)  
true if four integers are  
selected rather than  
five? Solution to this  
Discrete Math practice

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Principle  
problem is given in the  
video below!

Problems And  
Solutions  
Pigeonhole Principle  
problems - Discrete  
Math - MathCabin.com

Although this theorem  
seems obvious, many  
challenging olympiad  
problems can be solved  
by applying the  
Pigeonhole Principle.  
Often, a clever choice of  
box is necessary. The

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extended version of the Pigeonhole Principle states that if objects are placed in boxes then at least one box must hold at least objects. Here denotes the ceiling function.

Art of Problem Solving  
The pigeonhole principle is used in these solutions (PDF). O6 In the worst case, consider

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that senator hates a set of 3 senators, while he himself is hated by a completely different set of 3 other senators.

Thus, given one senator, there may be a maximum of 6 other senators whom he cannot work with.

Solution - Art of  
Problem Solving  
By the pigeonhole

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principle, at least two of the five points will lie inside one of the four triangles. It is known that the length of a line segment inside a triangle is less than the length of its longest side. Therefore the distance  $(d)$  between the two points inside the small triangle is less than  $(q)$   $[d < q = \frac{1}{2}]$

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to the readers are totally  
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later than you air bad,  
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view of that difficult  
virtually this book.

Pigeonhole Principle  
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By the pigeonhole  
principle, two of our  $n + 1$   
numbers will be in the  
same pigeonhole  $\{$  and  
since the above sets  
were chosen to contain  
pairs of consecutive  
numbers, this means  
that we'll have a pair of

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consecutive numbers.

This means we'll have a pair of numbers with no factors in common. 2.

Pigeonhole Principle  
Solutions - University of  
Texas at Austin

Pigeonhole principle ly  
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Solution: Apply  
pigeonhole principle.

No. of colors  
(pigeonholes)  $n = 3$  No.  
of marbles (pigeons)  
 $K+1 = 4$  Therefore the  
minimum no. of marbles  
required =  $Kn+1$  By  
simplifying we get  
 $Kn+1 = 10$ .

Verification:

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$\text{ceil}[\text{Average}]$  is

$\lceil \frac{K_{n+1}}{n} \rceil = 4$   $\lceil \frac{K_{n+1}}{3} \rceil$   
 $= 4$   $K_{n+1} = 10$  i.e., 3 red  
+ 3 white + 3 blue +  
1 (red or white or blue) =  
10 Pigeonhole principle  
strong form –

Mathematics | The  
Pigeonhole Principle -  
GeeksforGeeks

Solution. Consider a  
 $4 \times 19$  grid of points in  
this plane. For each row

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of 4 points, in reference to the pigeon hole method, two must be the same color, for instance, green. Denote such a row “green” (a row can be two colors simultaneously) and consider the colors of all 19 rows. Again, by the pigeonhole principle, seven must be the same color.

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What is the pigeonhole principle: Definition, examples and ...

Pigeonhole Principle CS  
280 - Spring 2002.

Some of these problems are from Mathematical Circles (Russian Experience) by Dmitri Fomin, Sergey Genkin, and Ilia Itenberg. There are 20 points within a 3-meter square. Show that some set of three of

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these points can be covered by a 1-meter square.

## Pigeonhole Problems - CS280

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everybody wants. The  
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to the readers are totally easy to understand. So, later than you air bad, you may not think in view of that difficult virtually this book. ...

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Problems These are  
some solutions to  
problems from Ravi

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Vakil's handout. 13.

Solution. Let  $S$  be any set of  $n+1$  distinct integers between 1 and  $2n$ . Define  $n$  sets  $T_i = \{i, 2i, 4i, 8i, 16i, \dots\} \cap S$  with  $i = 1, 3, 5, \dots, 2n-1$ . The set  $T_1 \cup T_3 \cup T_5 \cup \dots \cup T_{2n-1}$  contains all integers from 1 to  $2n$ , and therefore contains all  $n+1$  elements of  $S$ .

Solution.  $S = \{f, g$

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Lesson 2: Solutions to  
the Pigeonhole Principle  
Problems 1: Show that  
at any party there are  
two people who have  
the same number of  
friends at the party  
(assume that all  
friendships are mutual).  
Solution: Let  $n$  be the  
number of people at the  
party. Each person can  
have  $0; 1; \dots; n - 2$  or  $n - 1$   
friends.

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## Lesson 2: Solutions to the Pigeonhole Principle Problems

One of the simplest concepts in Math, but the number of uses it has are just bizarre. A must-know for any person doing competition math, or even just for peo...

Pigeonhole principle

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explained with  
examples ( v.easy to ...  
Pigeonhole Principle  
Problems And Solutions

Pigeonhole Principle  
Problems 1. A party is  
de ned to be successful  
if one of two things  
happen: three mutual  
friends are reunited, or  
three mutual strangers  
are brought together.  
Prove that every party  
of 6 people is

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Principles, but that there is an unsuccessful party of 5 people.

## Pigeonhole Principle Problems With Solutions

Using the pigeonhole principle, we can approach the problem as follows: Consider each of the  $n$  evenly spaced segments as a "box" and each of the  $n + 1$

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points as an item to be placed into the boxes.

Pigeonhole Principle |  
Brilliant Math &  
Science Wiki

We introduce the pigeonhole principle, an important proof technique.

#DiscreteMath

#Mathematics #Proofs

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<http://bit.ly/1zBPlvm> ...

## Problems And Solutions PIGEONHOLE PRINCIPLE -

DISCRETE  
MATHEMATICS -  
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In problem solving, the difficulty of applying the pigeonhole principle consists in figuring out which are the 'objects' and which are the 'boxes'. 44 Problem 1.



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Prove that in a group of three people, there must be two of the same sex.

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MATHEMATICAL

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## Solutions