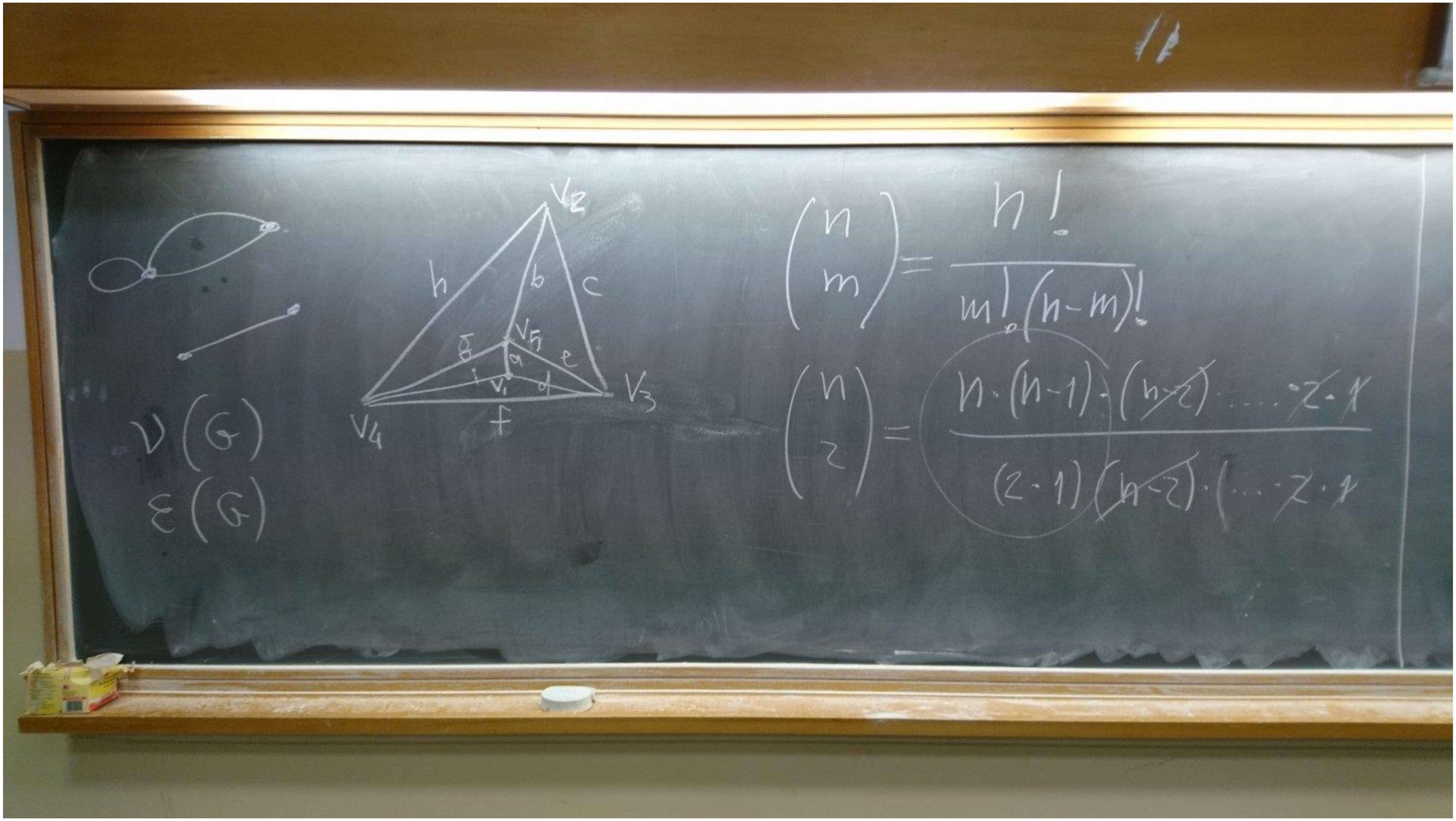
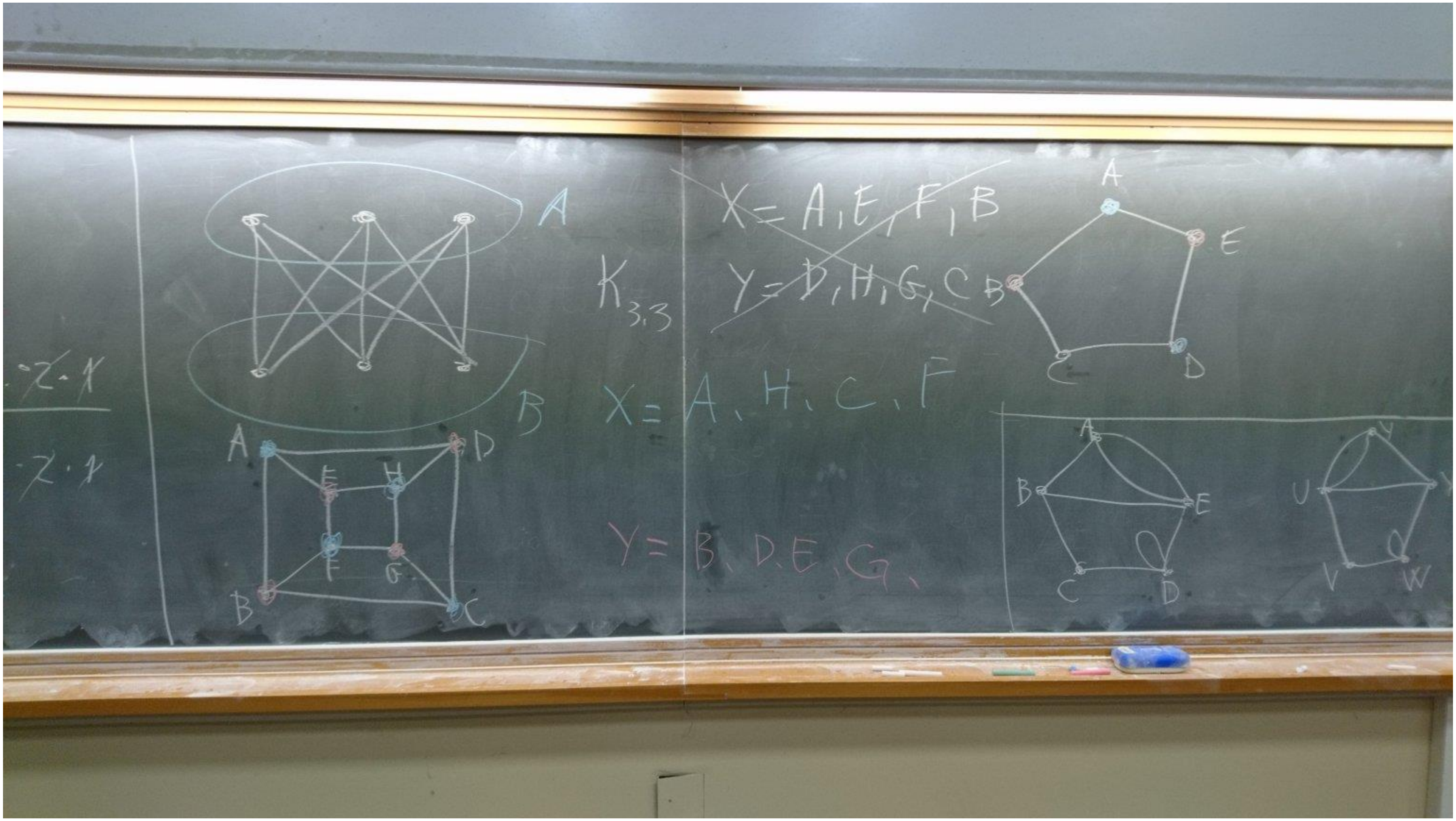
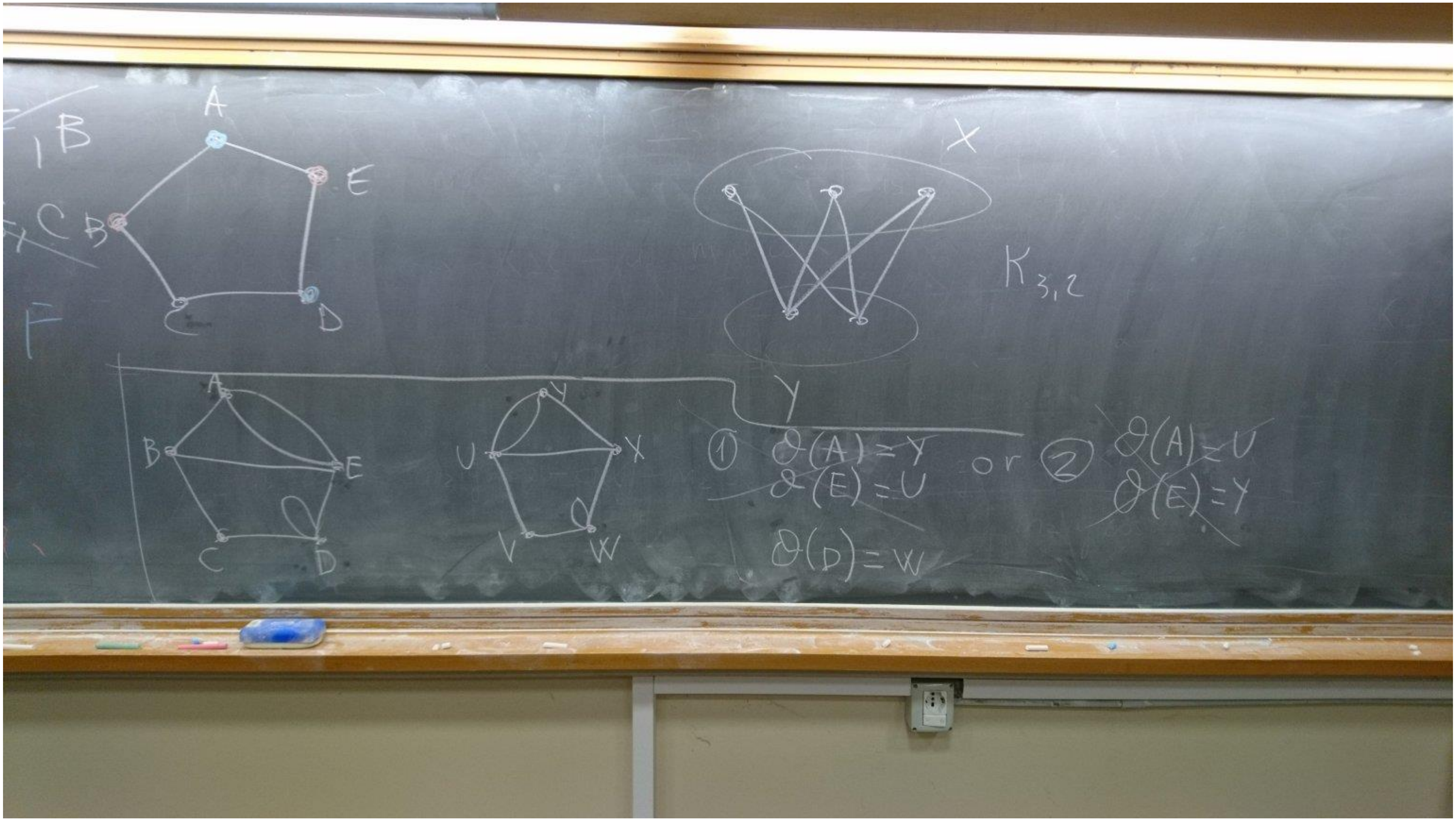
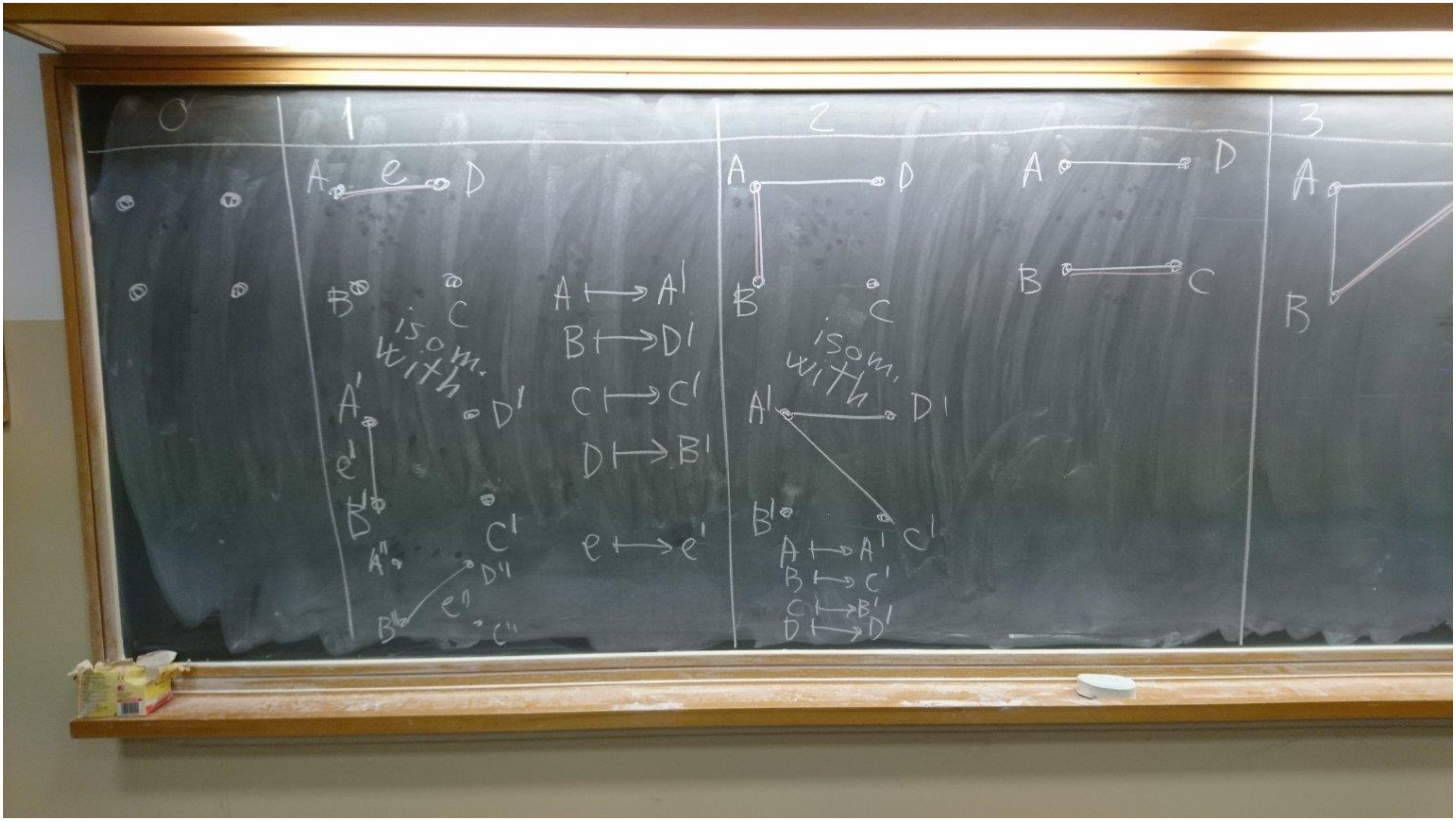
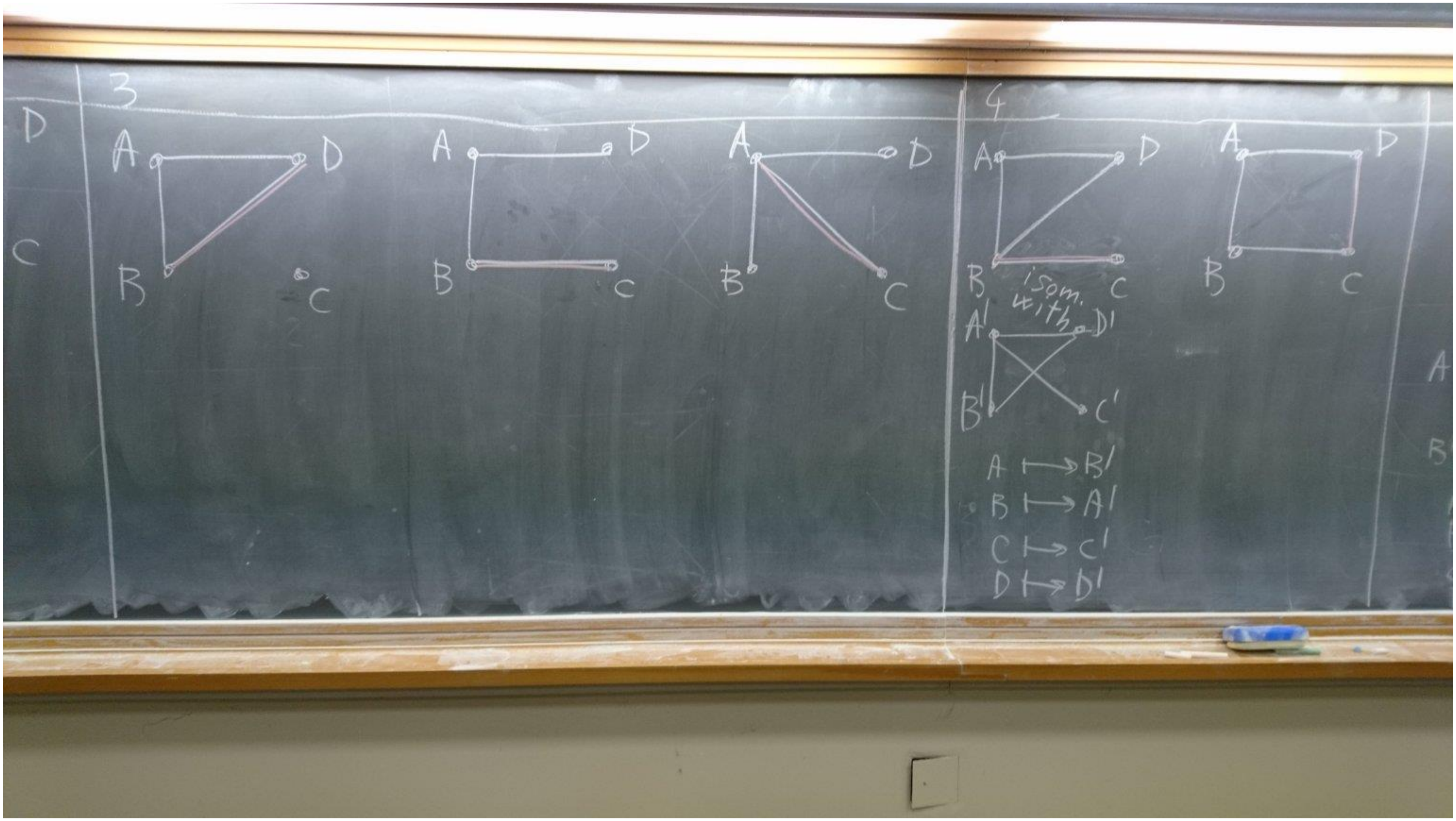
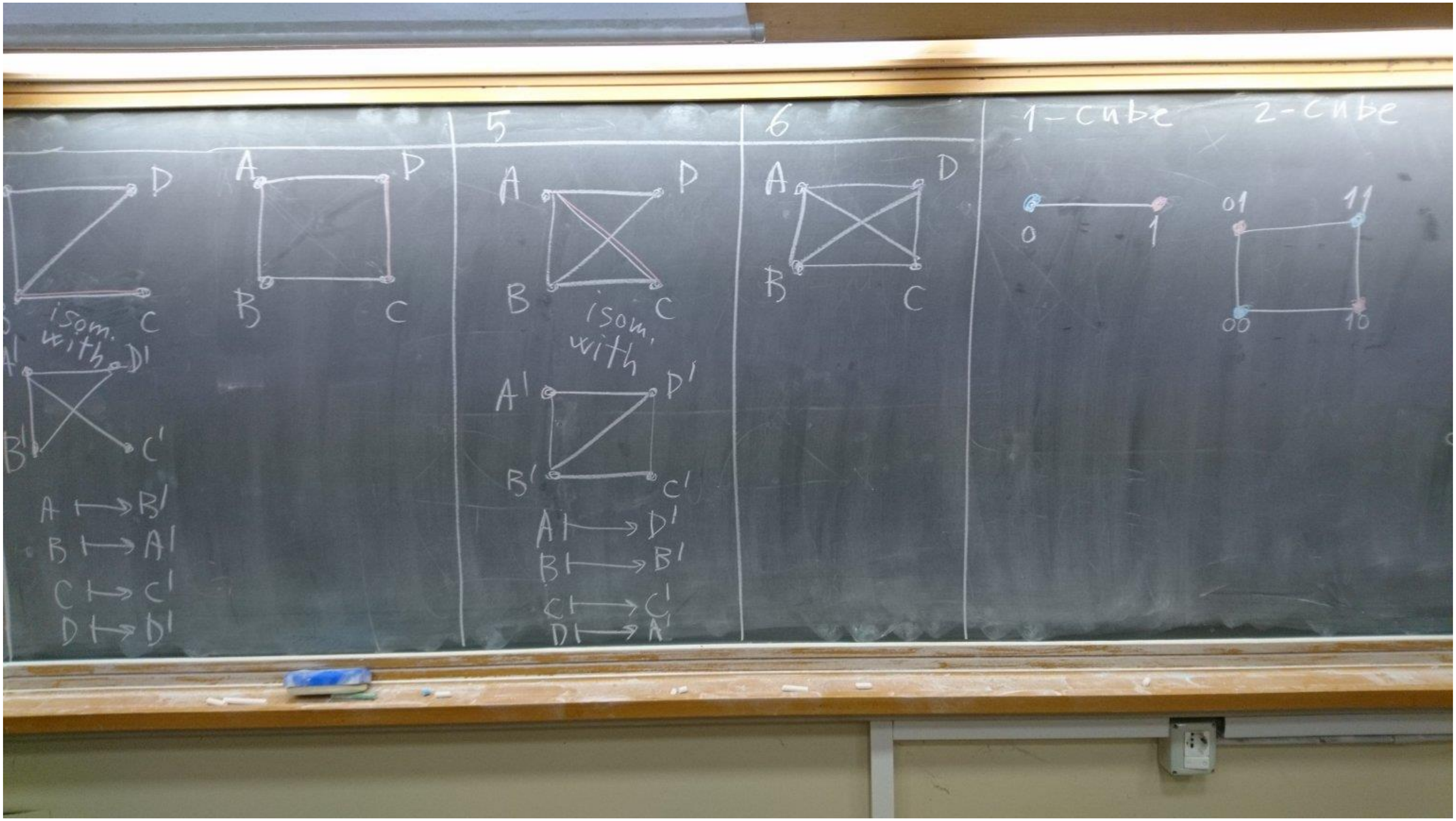

V2
h
b
c
V5
g
a
e
i
V1
d
V3
V4
f
V(G)
E(G)
(n m) = n! / m! (n-m)!
(n 2) = n·(n-1)·(n-2)·....·2·1 / (2·1)(n-2)·(....·2·1


A
B
$K_{3,3}$
X = A, E, F, B
Y = D, H, G, C
X = A, H, C, F
Y = B, D, E, G
A
E
B
C
D
A
B
E
C
D
U
V
W

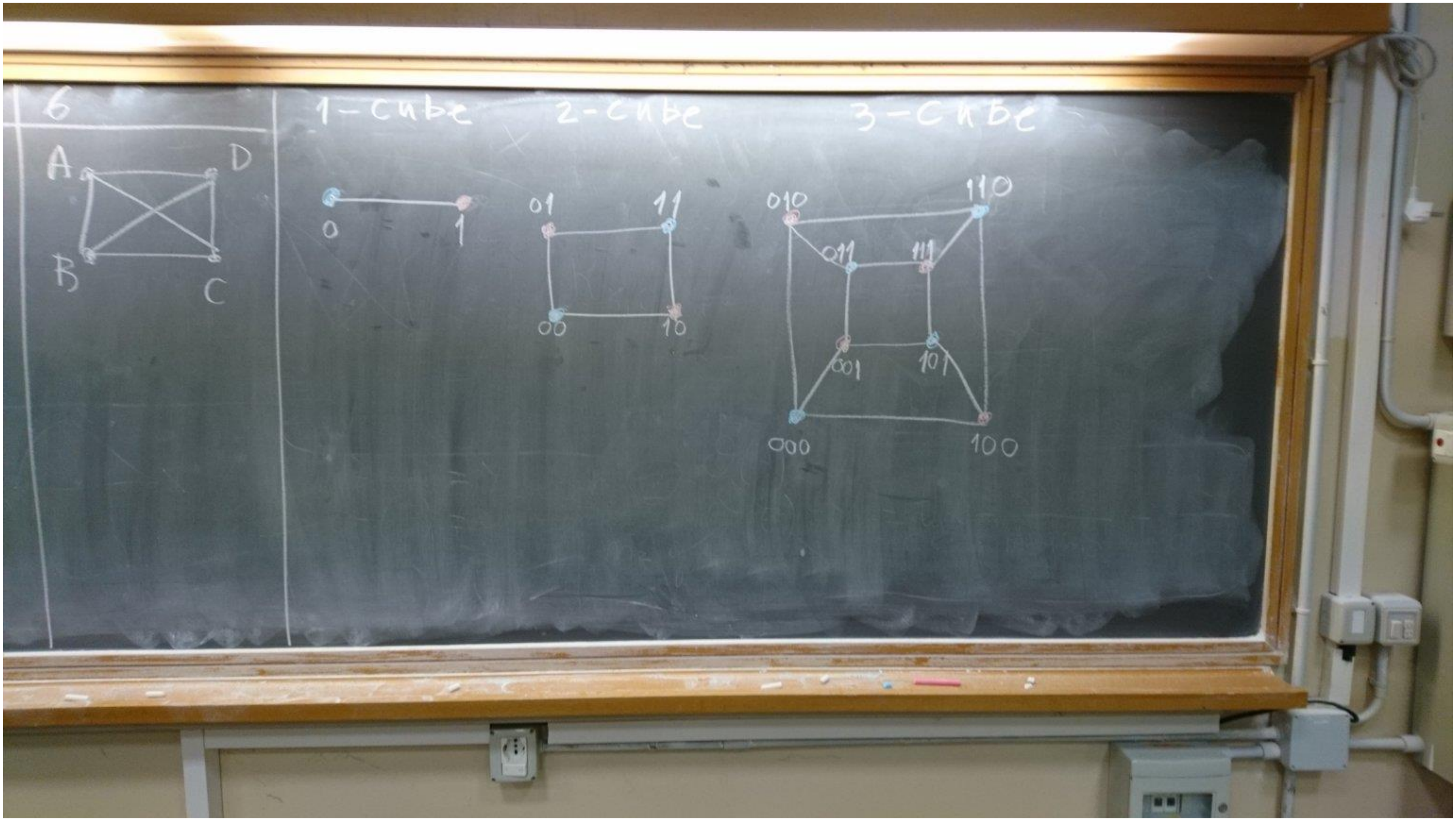

A
B
C
D
E
F
X
Y
$K_{3,2}$
U
V
W
① θ(A) = Y
θ(E) = U
or ② θ(A) = U
θ(E) = Y
θ(D) = W

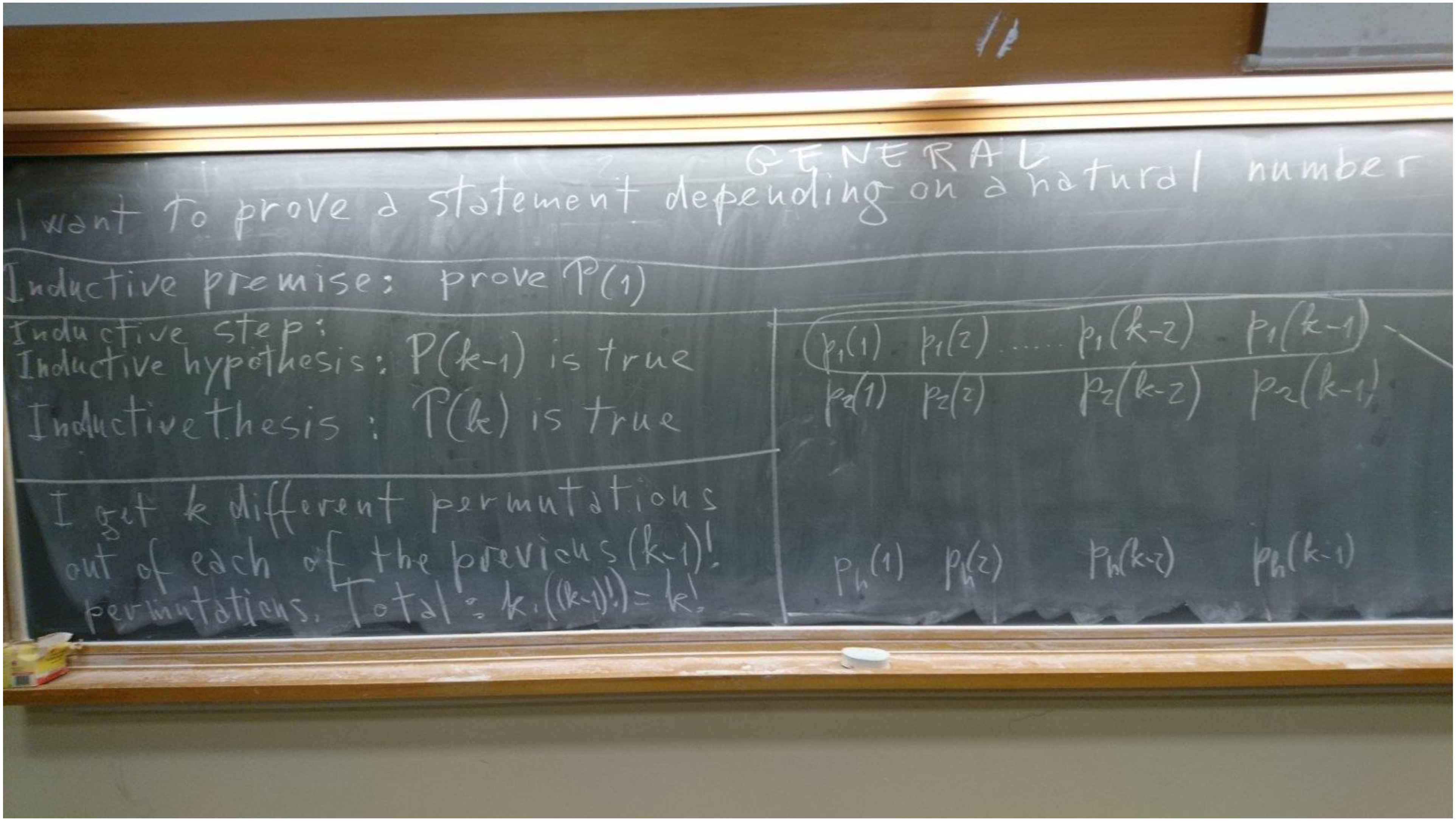

0
1
2
3
A e D
B C
isom. with
A' D'
e'
B' C'
A ⟼ A'
B ⟼ D'
C ⟼ C'
D ⟼ B'
e ⟼ e'
A'' D''
e''
B'' C''
A D
B C
isom. with
A' D'
B' C'
A ⟼ A'
B ⟼ C'
C ⟼ B'
D ⟼ D'
A D
B C
A
B

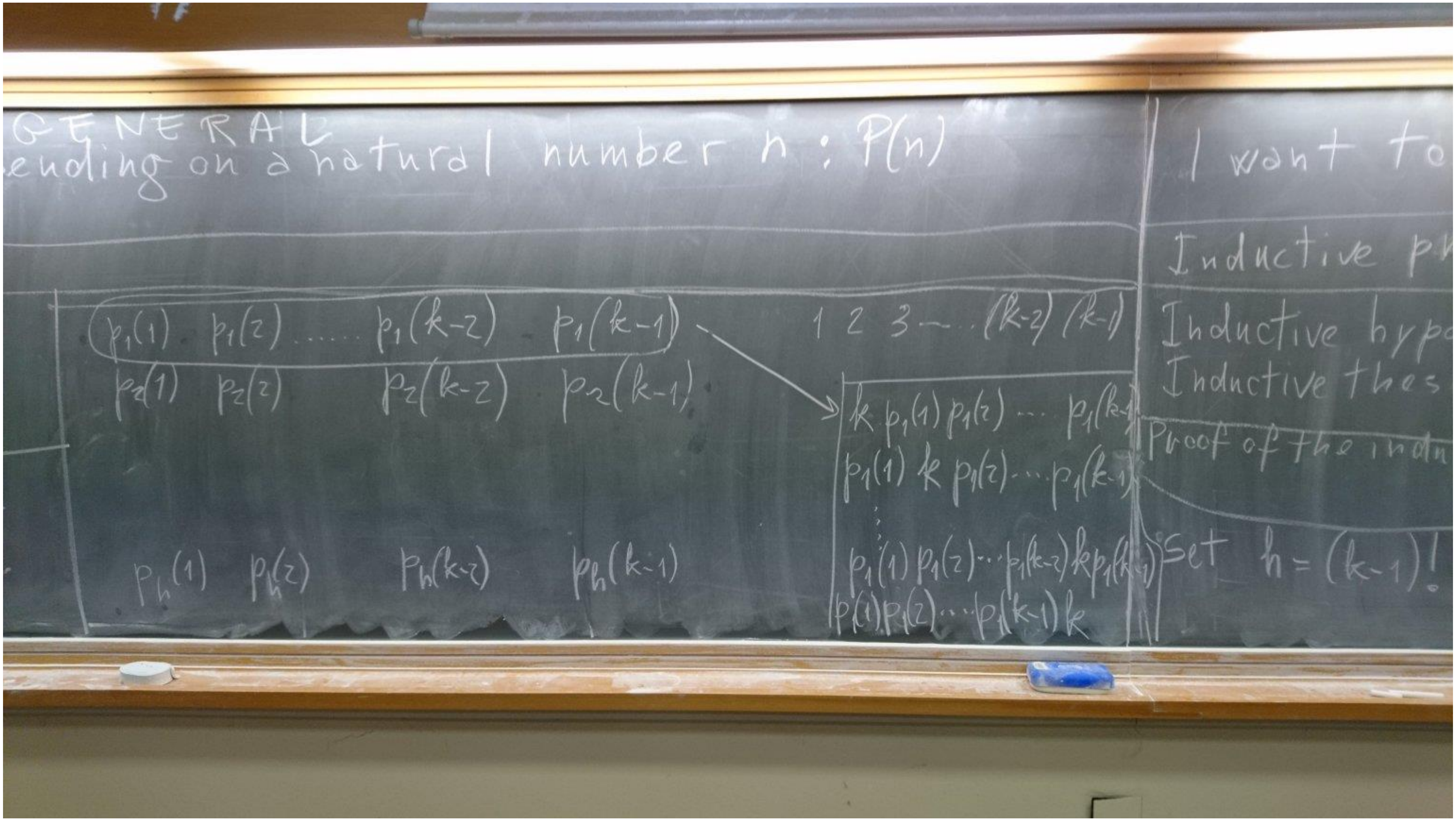

3
A
B
C
D
4
isom. with
A'
B'
C'
D'
A ↦ B'
B ↦ A'
C ↦ C'
D ↦ D'

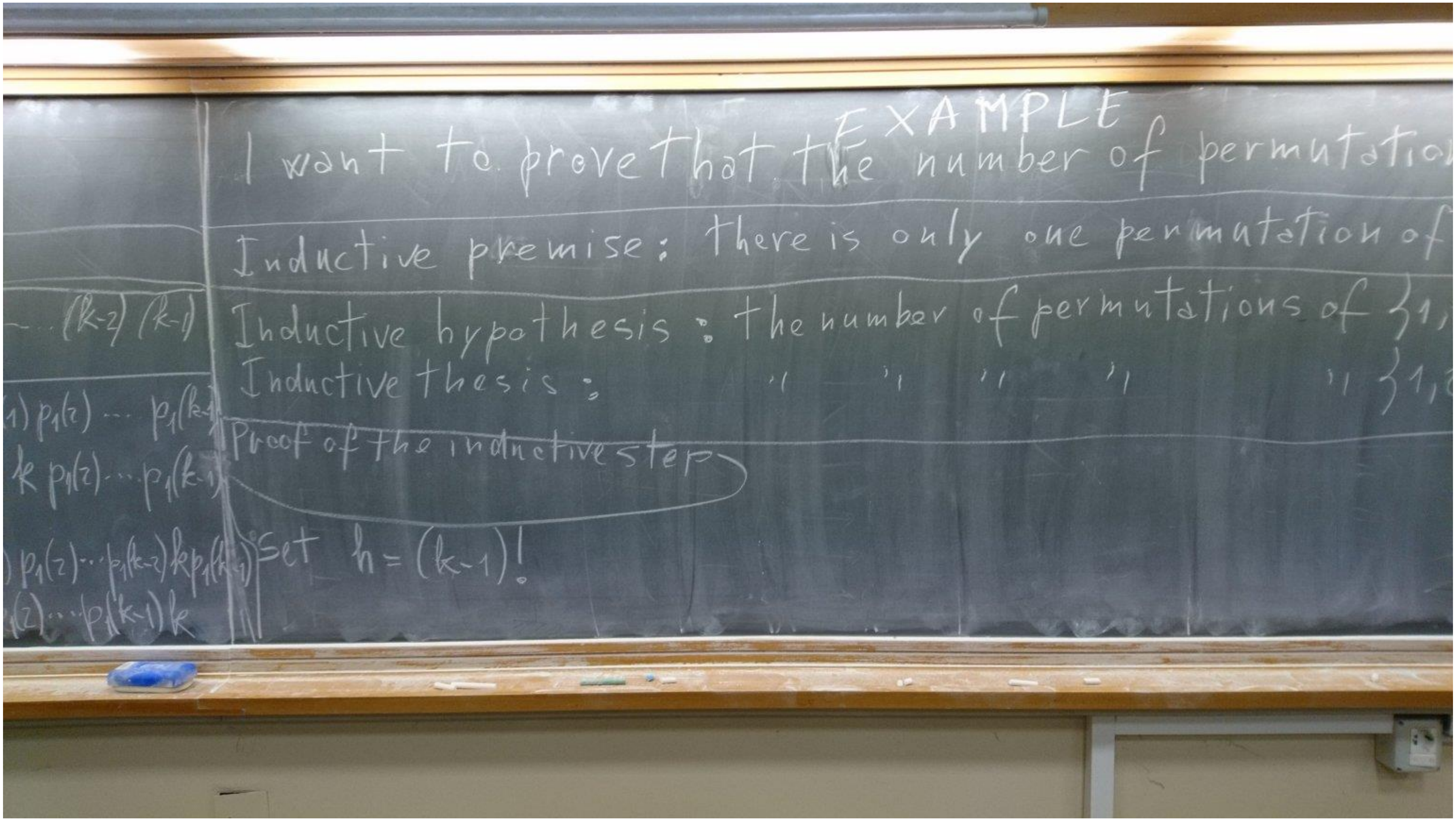


5
6
1-cube
2-cube
A
D
B
C
isom. with
A'
D'
B'
C'
A ⟼ B'
B ⟼ A'
C ⟼ C'
D ⟼ D'
A ⟼ D'
B ⟼ B'
C ⟼ C'
D ⟼ A'
0
1
01
11
00
10


6
A
D
B
C
1-cube
0
1
2-cube
01
11
00
10
3-cube
010
110
011
111
001
101
000
100


GENERAL
I want to prove a statement depending on a natural number
Inductive premise: prove P(1)
Inductive step:
Inductive hypothesis: P(k-1) is true
Inductive thesis: P(k) is true
I get k different permutations out of each of the previous (k-1)! permutations. Total: k·((k-1)!) = k!
p1(1) p1(2) ...... p1(k-2) p1(k-1)
p2(1) p2(2) p2(k-2) p2(k-1)
pn(1) pn(2) pn(k-2) pn(k-1)


GENERAL
ending on a natural number n : P(n)
p1(1) p1(2) ...... p1(k-2) p1(k-1)
p2(1) p2(2) p2(k-2) p2(k-1)
ph(1) ph(2) ph(k-2) ph(k-1)
1 2 3 ..... (k-2) (k-1)
k p1(1) p1(2) ... p1(k-1)
p1(1) k p1(2) ... p1(k-1)
p1(1) p1(2) ... p1(k-2) k p1(k-1)
p1(1) p1(2) ... p1(k-1) k
I want to
Inductive p
Inductive hyp
Inductive thes
Proof of the ind
Set h = (k-1)!


EXAMPLE
I want to prove that the number of permutatio
Inductive premise: there is only one permutation of
Inductive hypothesis: the number of permutations of {1,
Inductive thesis: " " " " " {1,
Proof of the inductive step
Set h = (k-1)!
... (k-2) (k-1)
1) p1(2) .... p1(k-1)
k p1(2)....p1(k-1)
) p1(2)...p1(k-2) k p1(k-1)
(2)....p1(k-1) k

EXAMPLE

t. the number of permutations of $\{1,2,\ldots,n\}$ is $n!$

here is only one permutation of $\{1\}$; and $1! = 1$

the number of permutations of $\{1,2,\ldots,k-1\}$ is $(k-1)! = (k-1)(k-2)\cdot\ldots\cdot 2\cdot 1$

" " " " " $\{1,2,\ldots,k-1,k\}$ is $k!$

1	21	321	231	21 3
	12	312	132	123