**Домашняя работа по дискретной математике №5**

**Вариант 163**

**Хромов Даниил P3115**

**G1:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| V/V | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | x9 | x10 | x11 | x12 | r |
| x1 | 0 | 1 | 1 |  |  | 1 |  |  | 1 | 1 | 1 |  | 6 |
| x2 | 1 | 0 |  | 1 | 1 | 1 |  | 1 |  | 1 |  | 1 | 7 |
| x3 | 1 |  | 0 |  |  |  |  | 1 |  | 1 |  |  | 3 |
| x4 |  | 1 |  | 0 |  | 1 | 1 | 1 |  |  | 1 | 1 | 6 |
| x5 |  | 1 |  |  | 0 |  |  | 1 | 1 |  | 1 | 1 | 5 |
| x6 | 1 | 1 |  | 1 |  | 0 | 1 | 1 | 1 | 1 | 1 |  | 8 |
| x7 |  |  |  | 1 |  | 1 | 0 |  |  |  | 1 |  | 3 |
| x8 |  | 1 | 1 | 1 | 1 | 1 |  | 0 |  |  |  |  | 5 |
| x9 | 1 |  |  |  | 1 | 1 |  |  | 0 | 1 | 1 | 1 | 6 |
| x10 | 1 | 1 | 1 |  |  | 1 |  |  | 1 | 0 |  |  | 5 |
| x11 | 1 |  |  | 1 | 1 | 1 | 1 |  | 1 |  | 0 |  | 6 |
| x12 |  | 1 |  | 1 | 1 |  |  |  | 1 |  |  | 0 | 4 |

**G2:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| V/V | y1 | y2 | y3 | y4 | y5 | y6 | y7 | y8 | y9 | y10 | y11 | y12 | R |
| y1 | 0 | 1 | 1 | 1 |  |  |  |  |  |  |  |  | 3 |
| y2 | 1 | 0 |  |  | 1 |  | 1 |  | 1 |  |  |  | 4 |
| y3 | 1 |  | 0 |  |  |  |  |  | 1 |  |  | 1 | 3 |
| y4 | 1 |  |  | 0 |  |  |  |  | 1 | 1 | 1 | 1 | 5 |
| y5 |  | 1 |  |  | 0 |  |  | 1 | 1 | 1 | 1 | 1 | 6 |
| y6 |  |  |  |  |  | 0 | 1 | 1 | 1 | 1 |  | 1 | 5 |
| y7 |  | 1 |  |  |  | 1 | 0 |  | 1 | 1 | 1 | 1 | 6 |
| y8 |  |  |  |  | 1 | 1 |  | 0 | 1 | 1 | 1 | 1 | 6 |
| y9 |  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |  | 1 |  | 8 |
| y10 |  |  |  | 1 | 1 | 1 | 1 | 1 |  | 0 |  | 1 | 6 |
| y11 |  |  |  | 1 | 1 |  | 1 | 1 | 1 |  | 0 |  | 5 |
| y12 |  |  | 1 | 1 | 1 | 1 | 1 | 1 |  | 1 |  | 0 | 7 |

**Проверить на изоморфизм графы G1 и G2.**

Для графа G1 Σρ(x)=64. Список Ρ(x) = {6,7,3,6,5,8,3,5,6,5,6,4 }.

Для графа G2 Σρ(y)=64. Список Ρ(y) = {3,4,3,5,6,5,6,6,8,6,5,7 }.

Разобьем вершины обоих графов на классы по их степеням.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | p(x) = p(y) = 8 | p(x) = p(y) = 7 | p(x) = p(y) = 6 | p(x) = p(y) = 5 | p(x) = p(y) = 4 | p(x) = p(y) = 3 |
| X | X6 | X2 | X1, x4, x9, x11 | X5, x8, x10, | X12 | X3, x7 |
| Y | Y9 | Y12 | y5, y7, y8, y10 | Y4, y6, y11 | Y2 | Y1, y3 |



Из таблицы сразу видно соответствие вершин графов:

|  |  |
| --- | --- |
| X | Y |
| X12 | Y2 |
| X2 | Y12 |
| X6 | Y9 |

Переберем всевозможные комбинации связей оставшихся вершин и получим соответствие:

|  |  |
| --- | --- |
| X | Y |
| X12 | Y2 |
| X2 | Y12 |
| X6 | Y9 |
| X1 | Y5 |
| X4 | Y7 |
| X9 | Y8 |
| X11 | Y10 |
| X5 | Y4 |
| X8 | Y6 |
| X10 | Y11 |
| X3 | Y1 |
| X7 | Y3 |

Вывод: графы G1 и G2 изоморфны.