**Задание №4**

Задача №1

Решить систему линейных уравнений однозначной разрешимости методом Крамера, Гаусса и матричным.

Решение

1. Методом Крамера

|  |
| --- |
| -1 2 -3 5  3 -1 7 -1  -4 3 -2 1  1 1 3 2 |

=26

∆ =

|  |
| --- |
| -6 2 -3 5  -2 -1 7 -1  14 3 -2 1  -2 1 3 2 |

= -78

∆1 =

|  |
| --- |
| -1 -6 -3 5  3 -2 7 -1  -4 14 -2 1  1 -2 3 2 |

= 52

∆2 =

|  |
| --- |
| -1 2 -6 5  3 -1 -2 -1  -4 3 14 1  1 1 -2 2 |

= 26

∆3 =

|  |
| --- |
| -1 2 -3 -6  3 -1 7 -2  -4 3 -2 14  1 1 3 -2 |

= -52

∆4=

Изм.

Лист

№ докум.

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Задача 1

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x1 = ∆1/∆ = -78/26 = -3

x2 = ∆2/∆ = 52/26 = 2

x3 = ∆3/∆ = 26/26 = 1

x4 = ∆4/∆ = -52/26 = -2 Ответ: ;

1. Методом Гаусса

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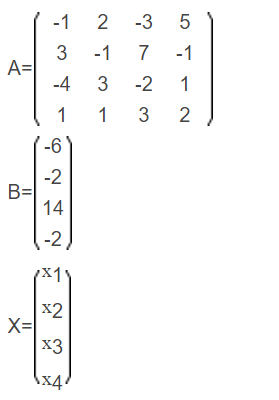
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Ответ: ;

1. Матричный метод



Задача 1

A · X = B  
значит  
X = A-1 · B

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M11 = (-1)1+1 | |  |  |  | | --- | --- | --- | | -1 | 7 | -1 | | 3 | -2 | 1 | | 1 | 3 | 2 | | = | -39 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M12 = (-1)1+2 | |  |  |  | | --- | --- | --- | | 3 | 7 | -1 | | -4 | -2 | 1 | | 1 | 3 | 2 | | = | -52 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M13 = (-1)1+3 | |  |  |  | | --- | --- | --- | | 3 | -1 | -1 | | -4 | 3 | 1 | | 1 | 1 | 2 | | = | 13 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M14 = (-1)1+4 | |  |  |  | | --- | --- | --- | | 3 | -1 | 7 | | -4 | 3 | -2 | | 1 | 1 | 3 | | = | 26 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M21 = (-1)2+1 | |  |  |  | | --- | --- | --- | | 2 | -3 | 5 | | 3 | -2 | 1 | | 1 | 3 | 2 | | = | -56 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M22 = (-1)2+2 | |  |  |  | | --- | --- | --- | | -1 | -3 | 5 | | -4 | -2 | 1 | | 1 | 3 | 2 | | = | -70 |

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Задача 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M23 = (-1)2+3 | |  |  |  | | --- | --- | --- | | -1 | 2 | 5 | | -4 | 3 | 1 | | 1 | 1 | 2 | | = | 22 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M24 = (-1)2+4 | |  |  |  | | --- | --- | --- | | -1 | 2 | -3 | | -4 | 3 | -2 | | 1 | 1 | 3 | | = | 30 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M31 = (-1)3+1 | |  |  |  | | --- | --- | --- | | 2 | -3 | 5 | | -1 | 7 | -1 | | 1 | 3 | 2 | | = | -19 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M32 = (-1)3+2 | |  |  |  | | --- | --- | --- | | -1 | -3 | 5 | | 3 | 7 | -1 | | 1 | 3 | 2 | | = | -14 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M33 = (-1)3+3 | |  |  |  | | --- | --- | --- | | -1 | 2 | 5 | | 3 | -1 | -1 | | 1 | 1 | 2 | | = | 7 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M34 = (-1)3+4 | |  |  |  | | --- | --- | --- | | -1 | 2 | -3 | | 3 | -1 | 7 | | 1 | 1 | 3 | | = | 6 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M41 = (-1)4+1 | |  |  |  | | --- | --- | --- | | 2 | -3 | 5 | | -1 | 7 | -1 | | 3 | -2 | 1 | | = | 79 |

Задача 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M42 = (-1)4+2 | |  |  |  | | --- | --- | --- | | -1 | -3 | 5 | | 3 | 7 | -1 | | -4 | -2 | 1 | | = | 102 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M43 = (-1)4+3 | |  |  |  | | --- | --- | --- | | -1 | 2 | 5 | | 3 | -1 | -1 | | -4 | 3 | 1 | | = | -25 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M44 = (-1)4+4 | |  |  |  | | --- | --- | --- | | -1 | 2 | -3 | | 3 | -1 | 7 | | -4 | 3 | -2 | | = | -40 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M = | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | http://matematikam.ru/css/images/math/lsm.gif | -39 | -52 | 13 | 26 | http://matematikam.ru/css/images/math/rsm.gif | | -56 | -70 | 22 | 30 | | -19 | -14 | 7 | 6 | | 79 | 102 | -25 | -40 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MT = | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | http://matematikam.ru/css/images/math/lsm.gif | -39 | -56 | -19 | 79 | http://matematikam.ru/css/images/math/rsm.gif | | -52 | -70 | -14 | 102 | | 13 | 22 | 7 | -25 | | 26 | 30 | 6 | -40 | |

Найдем обратную матрицу

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A-1 = MT/det(A) = | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | http://matematikam.ru/css/images/math/lsm.gif | -3/2 | -28/13 | -19/26 | 79/26 | http://matematikam.ru/css/images/math/rsm.gif | | -2 | -35/13 | -7/13 | 51/13 | | 1/2 | 11/13 | 7/26 | -25/26 | | 1 | 15/13 | 3/13 | -20/13 | |

Задача 1

Найдем решение

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X = A-1 · B = | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | http://matematikam.ru/css/images/math/lsm.gif | -3/2 | -28/13 | -19/26 | 79/26 | http://matematikam.ru/css/images/math/rsm.gif | | -2 | -35/13 | -7/13 | 51/13 | | 1/2 | 11/13 | 7/26 | -25/26 | | 1 | 15/13 | 3/13 | -20/13 | | · | |  |  |  | | --- | --- | --- | | http://matematikam.ru/css/images/math/lsm.gif | -6 | http://matematikam.ru/css/images/math/rsm.gif | | -2 | | 14 | | -2 | | = | |  |  |  | | --- | --- | --- | | http://matematikam.ru/css/images/math/lsm.gif | -3 | http://matematikam.ru/css/images/math/rsm.gif | | 2 | | 1 | | -2 | |
|  |  |  |  |  |  |

Ответ: ;

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Задача 1

Задача 1

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