|  |  |  |
| --- | --- | --- |
| Сложение |  | Вычитание |
| a | b |  | a | b |
| x | y | x | y |  | x | y | x | y |
| 1 | 1.732 | 5 | 0 |  | 1 | 1.732 | 5 | 0 |
| a+b | **6** | **1.73205** |  |  | a-b | **-4** | **1.7321** |  |
|  |  |  |  |  |  |  |  |  |
| 1 | a | 2 | b |  | 2 | a | 1 | b |
| mx | my | nx | ny |  | mx | my | nx | ny |
| 1 | 1.732 | 10 | 0 |  | 2 | 3.464 | 5 | 0 |
| ma+nb | **11** | **1.73205** |  |  | ma-nb | **-3** | **3.4641** |  |

|  |  |
| --- | --- |
| Вектор А | Вектор В |
| х | у | х | у |
| 11 | 1.732 | 3.464 | -3 |
| Модуль А | 11.135529 | Модуль В | 4.582576 |
| Угол между векторами |
|  | cos γ | 0.644902 |  |
|  |  γ | 0.869901 | радиан |
|  |  | 49.84167 | градус |

 49.84167933

|  |  |  |  |
| --- | --- | --- | --- |
| sin γ = | 0.764265 |  | S = А\*В\*sin γ = 39 |
|  |  |  |  |

Найдем [скалярное произведение векторов](http://ru.onlinemschool.com/math/library/vector/multiply/):

a · b = ax · bx + ay · by

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| a · b =  | 11 |  ·  | 3.4641 |  +  | 1.73205 |  ·  | (-3) |  =  | 38.1051 |  -  | 5.19615 |  =  | 32.90896534 |
|
| Найдем [длины векторов](http://ru.onlinemschool.com/math/library/vector/length/):|a| = √(ax2 + ay2) = √(112 + (1.73205)2) == √(121 + 3) = √124 = = 11.13552873 |

|  |  |  |
| --- | --- | --- |
|  |  |  |
|

 |
|

|b| = √bx2 + by2 = √(3.4641)2 + (-3)2 =

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| = √12 + 9 = √21 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  =  |  |

|  |
| --- |
| 4.582575695 |
|  |

 |
|

 |
|
| |a||b| = √124\*√21= |

|  |
| --- |
| √2604 |
|  |

 |  |
|  | = | 51.02940329 |

**Найдем**[**угол между векторами**](http://ru.onlinemschool.com/math/library/vector/angl/)**:**

|  |  |
| --- | --- |
| cos α =  | a · b |
| |a||b| |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| cos α =  | 32.90896534 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  ≈  |  | 0.6449019000463488 |
|

 |
| 51.02940 |

α =  49.84167933 градуса