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