Instructor example

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mass (g) | Angle () |  | Force | x-component (*N*) | y-component (*N*) |
| 1 | 250 | 0 |  |  |  |  |
| 2 | 350 | 250 |  |  |  |  |
| e | 336 | 115 |  |  |  |  |
|  |  |  |  |  |  |  |

Assume

1. Calculate the magnitude for each force:

†

‡Note the conversion from grams(g) to kilograms(kg) so that I could present the results in Newtons(N) instead of millinewtons(mN)

1. Find the magnitudes of the component vectors for each force:

Set up the force equation as the sum of an x-component and a y-component:

Where

Sub in values for known quantities

Find the resultant force:

|  |  |  |
| --- | --- | --- |
| Force | X | y |
|  | 2.5N | 0 |
|  | -1.2N | -3.2N |
|  | 1.3N | -3.2N |

TOA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mass (g) | Angle () |  | Force | x-component (*N*) | y-component (*N*) |
| 1 | 549.9 | 174 |  |  |  |  |
| 2 | 299.9 | 306 |  |  |  |  |
| e | 415.0 | 21.3 |  |  |  |  |
|  |  |  |  |  |  |  |

1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mass (g) | Angle () |  | Force | x-component (*N*) | y-component (*N*) |
| 1 | 230.0 | 180 |  |  |  |  |
| 2 | 450.2 | 90 |  |  |  |  |
| e | 500.0 | 297.75 |  |  |  |  |
|  |  |  |  |  |  |  |

2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mass (g) | Angle () |  | Force | x-component (*N*) | y-component (*N*) |
| 1 | 549.9 | 174 |  |  |  |  |
| 2 | 299.9 | 306 |  |  |  |  |
| e | 415.0 | 12.3 |  |  |  |  |
|  |  |  |  |  |  |  |

3)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mass (g) | Angle () |  | Force | x-component (*N*) | y-component (*N*) |
| 1 | 300.0 | 250 |  |  |  |  |
| 2 | 150.0 | 300 |  |  |  |  |
| 3 | 399.8 | 30 |  |  |  |  |
| e | 390.1 | 144 |  |  |  |  |
|  |  |  |  |  |  |  |