**Лекция № 3. Ускорение**

**Цель:** ввести понятие «ускорение»; рассмотреть частные случаи ускоренного движения и вывести их законы.

**Основные понятия:**

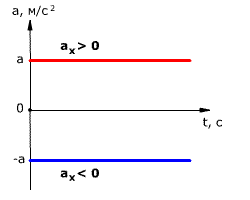
*Равнопеременное движение* – движение с постоянным ускорением.

Если ускорение [*a*] >0, то движение равноускоренное.

Если ускорение [*a*] <0, то движение равнозамедленное.

1. Ускорение

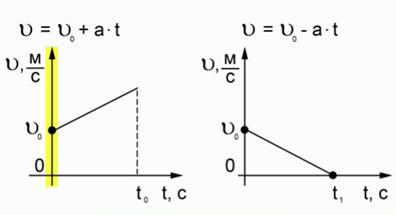




1. Скорость



где знак «+» будет соответствовать равноускоренному прямолинейному движению, знак «–» – равнозамедленному прямолинейному движению.



1. Путь



1. Координата





1. Дано уравнение скорости равнопеременного движения

а) ,

б) ,

в) ,

определите начальную скорость движения , ускорение движения . Постройте графики зависимости скорости от времени , ускорения от времени и запишите уравнение движения тела .

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| 8м/с2 | |  |  |  | | --- | --- | --- | | v | 5 | 13 | | t | 0 | 1 | | |  |  |  |  | | --- | --- | --- | --- | | v |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  | t | | |  |  |  |  | | --- | --- | --- | --- | | a |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  | t | |  |

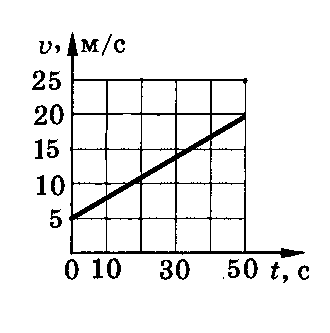


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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| -1м/с2 | | |  |  |  | | --- | --- | --- | | v | 3 | 2 | | t | 0 | 1 | | |  |  |  |  | | --- | --- | --- | --- | | v |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  | t | | |  |  |  |  | | --- | --- | --- | --- | | a |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  | t | |  | |
| в) , | | | | | |  | |
|  | |  |  |  | | --- | --- | --- | | v | 0 | 4 | | t | 0 | 1 | | | |  |  |  |  | | --- | --- | --- | --- | | v |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  | t | | |  |  |  |  | | --- | --- | --- | --- | | a |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  | t | |  | |

1. По графику зависимости скорости от времени рис. 1,2 определите начальную скорость , ускорение движения . Постройте графики зависимости ускорения от времени , запишите уравнения зависимости скорости от времени и пути от времени .

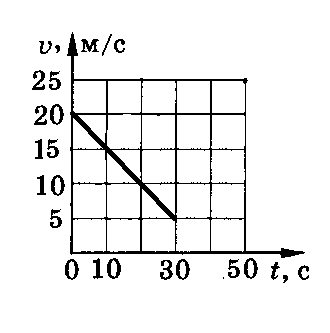
рис.1



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20 м/с  50 с | |  |  |  |  |  | | --- | --- | --- | --- | --- | | a |  |  |  |  | | 0.3 |  |  |  |  | |  |  |  |  |  | |  |  |  |  | t | | *5+0.3t* |  |

рис.2



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5м/с  30c | |  |  |  |  | | --- | --- | --- | --- | | a |  |  |  | |  |  |  |  | |  |  |  |  | | -0.5 |  |  | t | |  |  |  | |  |  |  |  | |  |  |

3. Дана начальная скорость и ускорение , запишите уравнение скорости …



10+2t