

26.5: The Work-Energy Theorem

Not only can energy be converted from one form to another, but it can also be converted into work, and vice versa. If a force is applied to a moving body over some distance, then work is done on the body, causing a change in its kinetic energy. The change in kinetic energy of the body is equal to the amount of work done. This result is called the work-energy theorem:

$$W = \Delta K \quad (26.5.1)$$

✓ Example 26.5.1

Suppose a body of mass 1000 kg is moving at a speed of 50 m/s. then its kinetic energy is $K = mv^2/2 = 1,250,000$ J. If we now do a work of 200,000 J on the body in the direction of motion what is its final velocity

Solution

By the work-energy theorem its kinetic energy will increase to 1,450,000 J Its final velocity will then be $v = \sqrt{2K/m} = 53.85$ m/s.

26.5: The Work-Energy Theorem is shared under a [CC BY-NC-SA 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/) license and was authored, remixed, and/or curated by LibreTexts.