

Question#21900

A 224 kg crate is pushed horizontally with a force of 710 N. if the coefficient of friction is .25, calculate the acceleration of the crate.

Solution:

Let:

$$m = 224\text{kg}$$

$$F = 710\text{N}$$

$$k = 0.25$$

According to the second Newton's law:

$$a = \frac{F - F_f}{m}, \text{ where } F_f \text{ is a friction force}$$

$$F_f = kmg$$

Where: $g=9.8 \text{ m/s}^2$ is the acceleration due the gravity.

$$a = \frac{F - kmg}{m}$$

$$a = \frac{710 - 0.25 \cdot 224 \cdot 9.8}{224} = 0.72 \text{ m/s}^2$$

Answer: 0.72 m/s^2