Question#18771

A 30 kg block on a frictionless surface experiences two perpendicular forces in the x and y directions. If the force in the x direction is 60 N, and the force in the y direction is 150 N, find the acceleration in the x-direction, the y-direction, and the net resultant acceleration.

Solution:

Such as the force's directions are perpendicular the accelerations are:

$$a_x = \frac{F_x}{m} = \frac{60}{30} = 2 \ m/s^2$$

$$a_y = \frac{F_y}{m} = \frac{150}{30} = 5 \ m/s^2$$

The resultant acceleration is:

$$a_R = \sqrt{a_x^2 + a_y^2} = \sqrt{2^2 + 5^2} = 5.39 \ m/s^2$$