A net force with magnitude (5.00 N/m2)x2 and directed at a constant angle of 31.0o with the +x-axis acts on an object of mass 0.250 kg as the object moves parallel to the x-axis. How fast is the object moving at x = 1.50 m if it has a speed of 4.00 m/s at x = 1.00 m?

The horizontal component of the force is the component that will cause the object to accelerate, and it has a magnitude of

$$F_x = Fcos(31°) = 0.86F$$

Using second Newton's law:

$$F_x = ma \rightarrow a = \frac{0.86F}{m} = \frac{0.86 * 5N}{0.25kg} = 17.2m/s^2$$

At time t object's position is:

$$x = x_0 + \frac{v^2 - v_0^2}{2a}$$

Assuming that $x = 1m$ is a starting point for object with $v_0 = 4m/s$:

$$v^2 = v_0^2 + 2(x - x_0)a$$

$$v = \sqrt{v_0^2 + 2(x - x_0)a}$$

$$v = \sqrt{(4m/s)^2 + 2 * (1.5m - 1m) * 17.2m/s^2} = 5.76m/s$$

Answer: $v = 5.76m/s$