Answer on Question #69002, Physics / Mechanics | Relativity

Question:

Block A has mass 3.0 kg, block B has mass 2.0 kg, and block C has mass 1.0 kg. The three blocks are on a frictionless surface connected with massless string as shown. A force of 12 N is pulling the block A to the left. What is the magnitude of the acceleration of block C?

Answer:

Let's assume that string is massless and non-stretched.
As total mass of the system is 3+2+1=6kg, its acceleration (According to 2nd Newton's law) is:

$$a_{system} = \frac{F}{m_{system}} = \frac{12}{6} = 2\,\frac{m}{s^2};$$

$Acceleration\ is\ the\ same\ for\ all\ of\ 3\ blocks, so\ acceleration\ of\ block\ C\ is\ 2\ m/s^2$

$$a_c = 2\,\frac{m}{s^2}$$