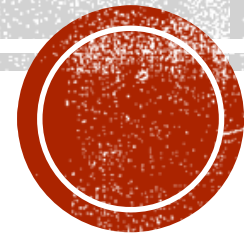


# NJUTNOVI ZAKONI

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Na osnovu slike i datih podataka odredi ubrzanje sistema tela i silu u koncu.

$$m_1 = 5\text{kg}$$

$$m_2 = 2\text{kg}$$

$$m_3 = 3\text{kg}$$

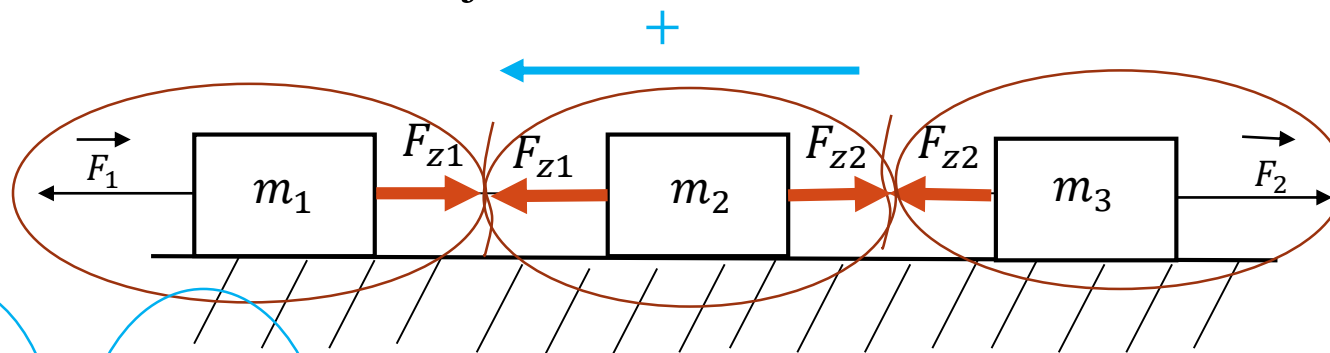
$$F_1 = 20\text{N}$$

$$F_2 = 5\text{N}$$

$$a = ?$$

$$F_{z1} = ?$$

$$F_{z2} = ?$$



$$m_1 \cdot a = F_1 - F_{z1}$$

$$m_2 \cdot a = F_{z1} - F_{z2}$$

$$m_3 \cdot a = F_{z2} - F_2$$

$$m_1 \cdot a + m_2 \cdot a + m_3 \cdot a = F_1 - F_{z1} + F_{z1} - F_{z2} + F_{z2} - F_2$$

$$a \cdot (m_1 + m_2 + m_3) = F_1 - F_2$$

$$a = \frac{F_1 - F_2}{m_1 + m_2 + m_3} = \frac{20\text{N} - 5\text{N}}{5\text{kg} + 2\text{kg} + 3\text{kg}} = \frac{15\text{N}}{10\text{kg}} = 1,5 \frac{\text{N}}{\text{kg}} = 1,5 \frac{\text{m}}{\text{s}^2}$$

$$m_1 \cdot a = F_1 - F_{z1}$$

$$F_{z1} = F_1 - m_1 \cdot a$$

$$F_{z1} = 20\text{N} - 5\text{kg} \cdot 1,5 \frac{\text{N}}{\text{kg}}$$

$$F_{z1} = 20\text{N} - 7,5\text{N} = 12,5\text{N}$$

$$m_3 \cdot a = F_{z2} - F_2$$

$$F_{z2} = F_2 + m_3 \cdot a$$

$$F_{z2} = 5\text{N} + 3\text{kg} \cdot 1,5 \frac{\text{N}}{\text{kg}}$$

$$F_{z2} = 5\text{N} + 4,5\text{N} = 9,5\text{N}$$

**PROVERA**

$$m_2 \cdot a = F_{z1} - F_{z2}$$

$$2\text{kg} \cdot 1,5 \frac{\text{N}}{\text{kg}} = 12,5\text{N} - 9,5\text{N}$$

$$3\text{N} = 3\text{N}$$

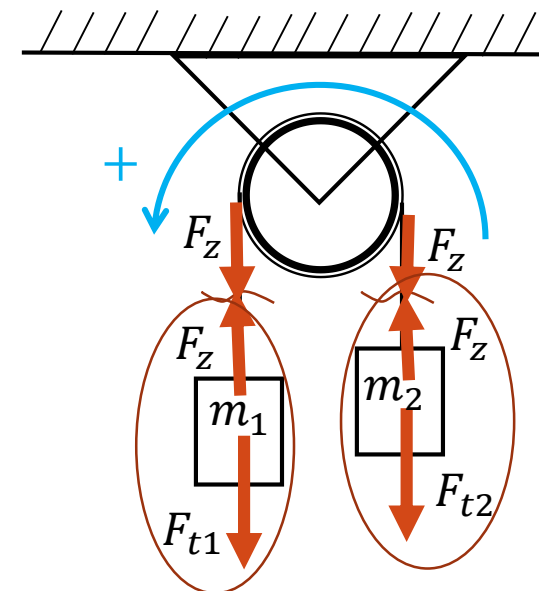
Na osnovu slike i datih podataka odredi ubrzanje sistema tela i silu u koncu.

$$m_1 = 3\text{kg} \quad \longrightarrow \quad F_{t1} = m_1 \cdot g = 3\text{kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 30\text{N}$$

$$m_2 = 2\text{kg} \quad \longrightarrow \quad F_{t2} = m_2 \cdot g = 2\text{kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 20\text{N}$$

$$a = ?$$

$$F_{z1} = ?$$



$$\begin{aligned} m_1 \cdot a &= F_{t1} - F_z \\ m_2 \cdot a &= F_z - F_{t2} \end{aligned}$$

### PROVERA

$$m_1 \cdot a = F_{t1} - F_z$$

$$F_z = F_{t1} - m_1 \cdot a$$

$$F_z = 30\text{N} - 3\text{kg} \cdot 2 \frac{\text{N}}{\text{kg}}$$

$$F_z = 30\text{N} - 6\text{N} = 24\text{N}$$

$$m_2 \cdot a = F_z - F_{t2}$$

$$2\text{kg} \cdot 2 \frac{\text{N}}{\text{kg}} = 24\text{N} - 20\text{N}$$

$$4\text{N} = 4\text{N}$$

$$m_1 \cdot a + m_2 \cdot a = F_{t1} - F_z + F_z - F_{t2}$$

$$a \cdot (m_1 + m_2) = F_{t1} - F_{t2}$$

$$a = \frac{F_{t1} - F_{t2}}{m_1 + m_2} = \frac{30\text{N} - 20\text{N}}{3\text{kg} + 2\text{kg}} = \frac{10\text{N}}{5\text{kg}} = 2 \frac{\text{N}}{\text{kg}} = 2 \frac{\text{m}}{\text{s}^2}$$

Na osnovu slike i datih podataka odredi ubrzanje sistema tela i silu u koncu.

$$m_1 = 5\text{kg}$$

$$m_2 = 2\text{kg}$$

$$m_3 = 3\text{kg}$$

$$F = 20\text{N}$$

$$a = ?$$

$$F_{z1} = ?$$

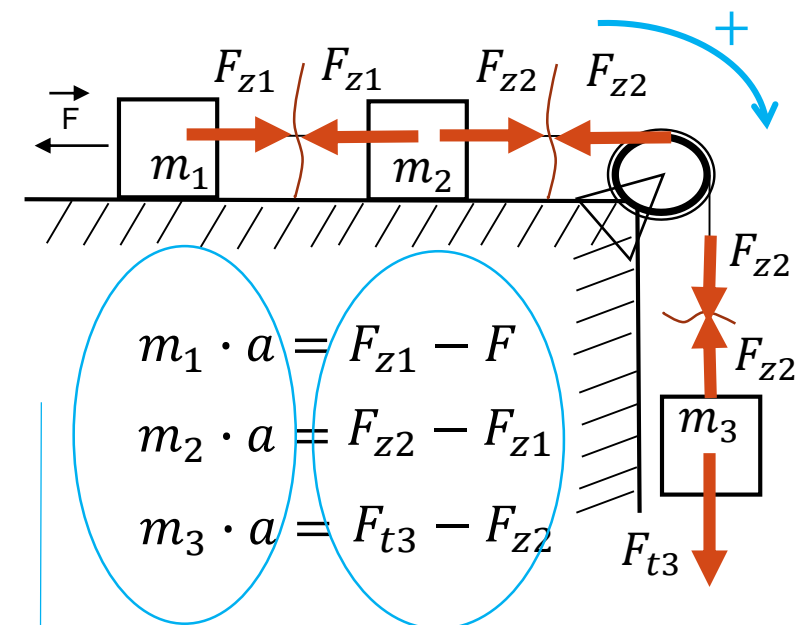
$$F_{z2} = ?$$

$$F_{t3} = m_3 \cdot g = 3\text{kg} \cdot 10 \frac{\text{N}}{\text{kg}} = 30\text{N}$$

$$m_1 \cdot a + m_2 \cdot a + m_3 \cdot a = F_{z1} - F + F_{z2} - F_{z1} + F_{t3} - F_{z2}$$

$$a \cdot (m_1 + m_2 + m_3) = -F + F_{t3}$$

$$a = \frac{F_{t3} - F}{m_1 + m_2 + m_3} = \frac{30\text{N} - 20\text{N}}{5\text{kg} + 2\text{kg} + 3\text{kg}} = \frac{10\text{N}}{10\text{kg}} = 1 \frac{\text{N}}{\text{kg}} = 1 \frac{\text{m}}{\text{s}^2}$$



$$m_1 \cdot a = F_{z1} - F$$

$$m_2 \cdot a = F_{z2} - F_{z1}$$

$$m_3 \cdot a = F_{t3} - F_{z2}$$

$$m_1 \cdot a = F_{z1} - F$$

$$F_{z1} = F + m_1 \cdot a$$

$$F_{z1} = 20\text{N} + 5\text{kg} \cdot 1 \frac{\text{N}}{\text{kg}}$$

$$F_{z1} = 20\text{N} + 5\text{N} = 25\text{N}$$

$$m_3 \cdot a = F_{t3} - F_{z2}$$

$$F_{z2} = F_{t3} - m_3 \cdot a$$

$$F_{z2} = 30\text{N} - 3\text{kg} \cdot 1 \frac{\text{N}}{\text{kg}}$$

$$F_{z2} = 30\text{N} - 3\text{N} = 27\text{N}$$

### PROVERA

$$m_2 \cdot a = F_{z2} - F_{z1}$$

$$2\text{kg} \cdot 1 \frac{\text{N}}{\text{kg}} = 27\text{N} - 25\text{N}$$

$$2\text{N} = 2\text{N}$$

Na osnovu slike i datih podataka odredi ubrzanje sistema tela i sile međusobnog delovanja tela.

$$m_1 = 2\text{kg}$$

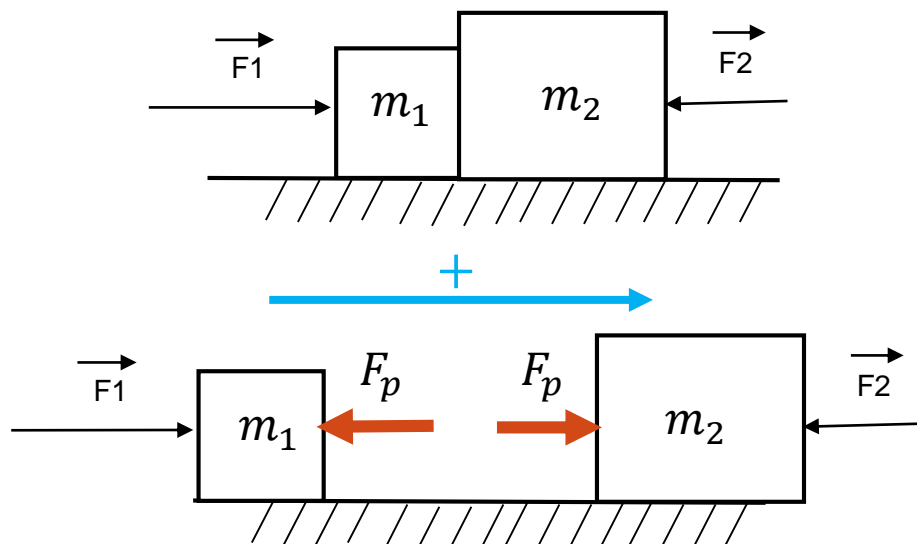
$$m_2 = 3\text{kg}$$

$$F_1 = 20\text{N}$$

$$F_2 = 5\text{N}$$

$$a = ?$$

$$F_p = ?$$



$$m_1 \cdot a = F_1 - F_p$$

$$m_2 \cdot a = F_p - F_2$$

$$m_1 \cdot a + m_2 \cdot a = F_1 - F_p + F_p - F_2$$

$$a \cdot (m_1 + m_2) = F_1 - F_2$$

$$a = \frac{F_1 - F_2}{m_1 + m_2} = \frac{20\text{N} - 5\text{N}}{3\text{kg} + 2\text{kg}} = \frac{15\text{N}}{5\text{kg}} = 3 \frac{\text{N}}{\text{kg}} = 3 \frac{\text{m}}{\text{s}^2}$$

$$m_1 \cdot a = F_1 - F_p$$

$$F_p = F_1 - m_1 \cdot a$$

$$F_p = 20\text{N} - 2\text{kg} \cdot 3 \frac{\text{N}}{\text{kg}}$$

$$F_p = 20\text{N} - 6\text{N} = 14\text{N}$$

### PROVERA

$$m_2 \cdot a = F_p - F_2$$

$$3\text{kg} \cdot 3 \frac{\text{N}}{\text{kg}} = 14\text{N} - 5\text{N}$$

$$9\text{N} = 9\text{N}$$