

Task:

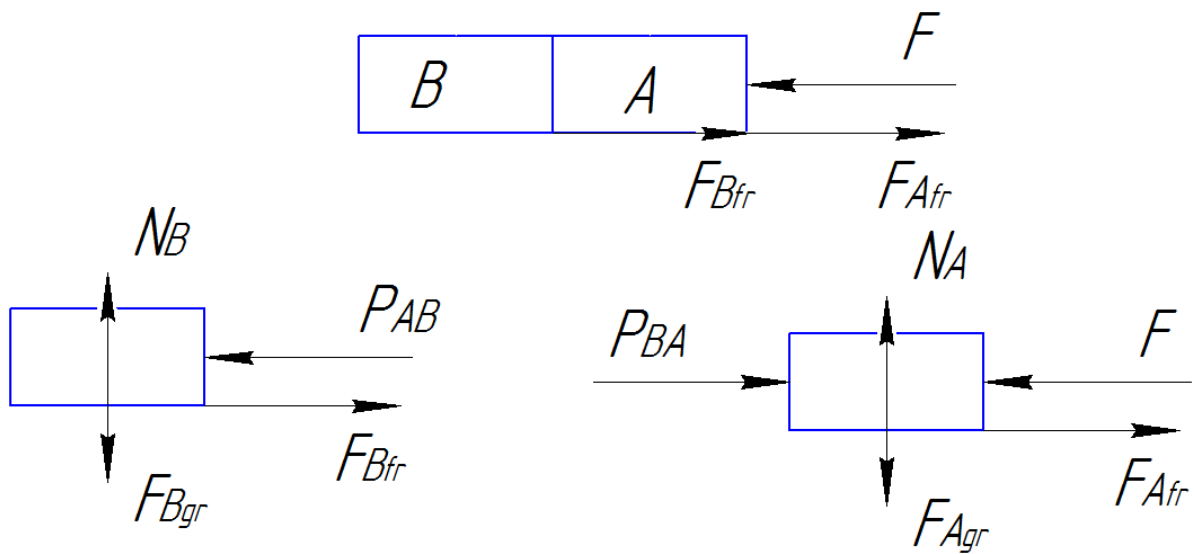
Suppose that there are two objects next to each other, object at the right is A, object at the left is B. Now we have these situations:

- 1) we push object A to the left side
- 2) we pull object B to the left side (in this case they're stuck to each other)

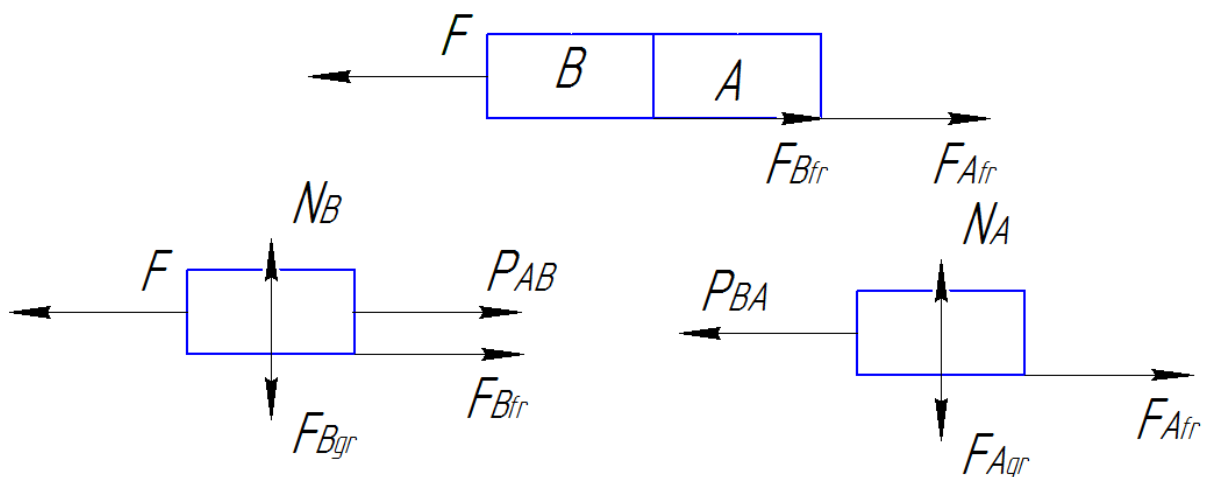
Do the forces that B exert on A have the same magnitude and direction in both situations?

Solution:

1)



2)



$$\begin{aligned}
 1) \quad m_A a &= F - P_{BA} - F_{Afr} = F - P_{BA} - \mu_A m_A g \\
 P_{BA} &= F - m_A a - \mu_A m_A g = F - m_A (a + \mu_A g) \\
 2) \quad m_A a &= P_{BA} - F_{Afr} = P_{BA} - \mu_A m_A g \\
 P_{BA} &= m_A a + \mu_A m_A g = m_A (a + \mu_A g)
 \end{aligned}$$

Answer:

The forces that B exert on A have different magnitudes and directions in different situations