Forces on 2 ∧ Objects
attached

$\boxed{2 \text{ kg}}$ ——— $\boxed{1 \text{ kg}}$ ———→ 12N

Same as

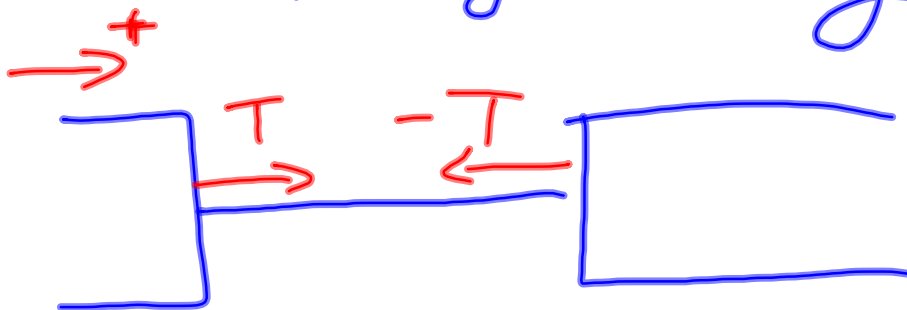$\boxed{3 \text{ kg}}$ ——12N→ $a = ?$

$$a_{system} = \frac{F_{system}}{m_{system}}$$

$$a_{system} = \frac{12N}{3kg} = 4 \, ^N/_{kg}$$

The acceleration of each object in a system is the same as the acceleration of the system
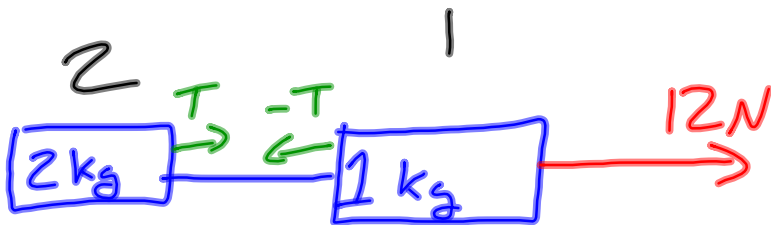
Can switch the bricks positions and it will not affect the acceleration of the system (or the individual bricks)

Tension

is a force
Usually on a string

T $-T$

The tension on a string is the same everywhere on the string.

2

1

T $-T$

$2kg$

$1\ kg$

$12N$

$F_{N}\tilde{g}$ T

F_{g2}

F_{N}

$-T$ $12N$

F_{Tg1}

$$a_2 = \frac{\sum F_2}{m_2}$$

$$a_1 = \frac{\sum F_1}{m_1}$$

$$a_2 = a_1 = a$$

$$a = \frac{T}{2kg}$$

$$a = \frac{(12N + (-T))}{1kg}$$

Problem 2

$\xrightarrow{\quad}{}^{+}$

$-F_2 \xleftarrow{\quad}\boxed{m_1}\xrightarrow{\quad}T_1$

$-T_1 \xleftarrow{\quad}\boxed{m_2}\xrightarrow{\quad}T_2$

$-T_2 \xleftarrow{\quad}\boxed{m_3}\xrightarrow{\quad}F_1$
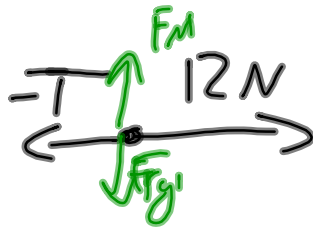
$-F_2 \xleftarrow{\quad}\bullet\xrightarrow{\quad}T_1$

$-T_1 \xleftarrow{\quad}\bullet\xrightarrow{\quad}T_2$
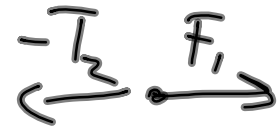
$-T_2 \xleftarrow{\quad}\bullet\xrightarrow{\quad}F_1$

$$a = \frac{-F_2 + T_1}{m_1}$$

$$a = \frac{-T_1 + T_2}{m_2}$$

$$a = \frac{-T_2 + F_1}{m_3}$$

Pulleys

$2\,kg$ 2 T

F_{g_2}

T 1 $4\,kg$

F_{g_1}

②

T

F_{g_2}

①

T

F_{g_1}