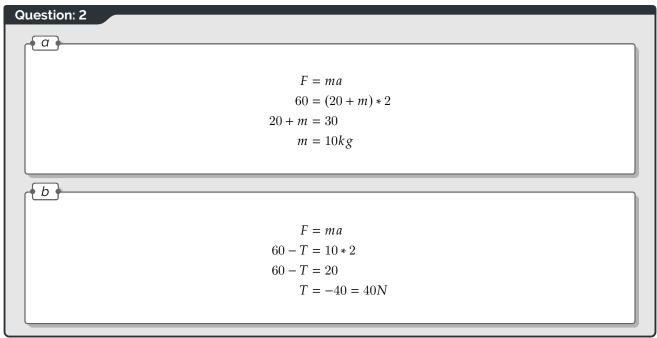
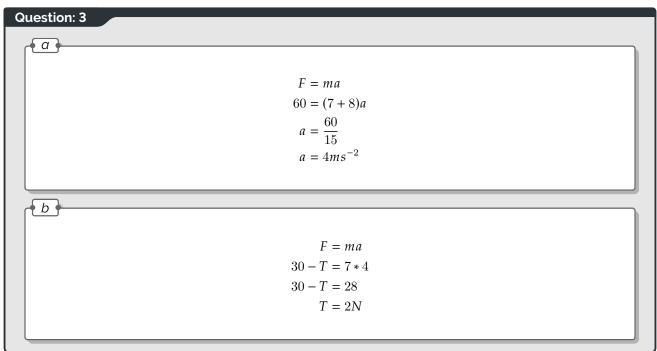
## Newton's 3<sup>rd</sup> Law Jack Maguire





## **Question: 4**



$$F = ma$$

$$T - (110 + 190 + 1700) * 9.8 = (110 + 190 + 1700) * -1.8$$

$$T = (110 + 190 + 1700) * (-9.8 - 1.8)$$

$$T = 23200N$$

**b** 



$$ma = F$$

$$110 * -1.8 = F - 190 * 9.8$$

$$F = -190 * 9.8 + 110 * 1.8$$

$$F = -1664 = 1660N$$

**₩** ii

$$\begin{aligned} ma &= F \\ 1700*-1.8 &= F - 110*9.8 - 190*9.8 \\ F &= -110*9.8 - 190*9.8 + 1700*1.8 \\ F &= 120N \end{aligned}$$

## **Question: 5**



$$F = ma$$

$$50000 - 4000 - 10000 = (3m + m) * 5$$

$$36000 = 20m$$

$$m = 1800kg$$

- Trailer: = 3m = 1800 \* 3 = 5400kg
- Lorry: = m = 1800kg

b

$$F = ma$$
 
$$50000 - 4000 - T = 1800 * 5$$
 
$$46000 - T = 9000$$
 
$$T = -37000 = 37000N$$

C

- I don't have to account for the mass of the tow-bar in F = ma calculations.
- $\cdot$  The Tension always remains the same on both sides.

## Question: 6

(a)

$$F = ma$$

$$180 - (10 + 5) * 9.8 = (10 + 5)a$$

$$33 = 15a$$

$$a = 2.2ms^{-2}$$

b

$$F = ma$$

$$180 - 10 * 9.8 - T = 10 * 2.2$$

$$-T = 22 - 180 + 98$$

$$T = 60N$$