34. First, we consider all the penguins (1 through 4, counting left to right) as one system, to which we apply Newton's second law:

$$
\begin{aligned}
F_{\text{net}} &= (m_1 + m_2 + m_3 + m_4)a \\
222\,\text{N} &= (20\,\text{kg} + 15\,\text{kg} + m_3 + 12\,\text{kg})a \ .
\end{aligned}
$$

Second, we consider penguins 3 and 4 as one system, for which we have

$$
\begin{aligned}
F'_{\text{net}} &= (m_3 + m_4)a \\
111\,\text{N} &= (m_3 + 12\,\text{kg})a \ .
\end{aligned}
$$

We solve these two equations for m_3 to obtain $m_3 = 23\,\text{kg}$. The solution step can be made a little easier, though, by noting that the net force on penguins 1 and 2 is also 111 N and applying Newton's law to them as a single system to solve first for a.