

# Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

## 4 Forces

### Exercise F, Question 6

#### Question:

The coefficient of friction between a sledge and a snowy surface is 0.2. The combined mass of a child and the sledge is 45 kg. What is the least horizontal force necessary to pull the sledge along the horizontal surface at a constant speed?

#### Solution:

Resolving horizontally

$$P = F$$

Resolving vertically

$$R = 441$$

Limiting friction

$$F = 0.2 \times R$$

$$P = 0.2 \times 441$$

$$P = 88.2 \text{ N (3 s.f.)}$$

