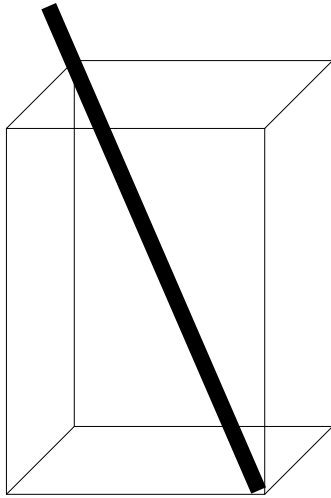


### Part A: How long must the straw be?

The designers of drink cartons must consider the length of straw required so that it will reach the bottom of the carton. We will make the following assumptions:

- the straw must protrude by 1.5 cm and that
- the hole is at one vertex of the carton so that
- the straw must be able to reach into the diagonally opposite corner of the base of the carton



- a Using an empty drink carton, measure the required length for the straw, including the extra 1.5 cm
- b Devise a method for calculating the required length.
- c Generalise your method for a rectangular carton of any dimensions.

### Part B: Packing a rod in a carton

A 2.5 m rod is to be packed diagonally into a rectangular carton for delivery. If the base of the carton is 1.6 m by 1.5 m, what minimum height is required for the carton?

### Part C: Guy ropes for a flagpole

A 10 m flagpole is to be supported at the centre of a 12 m square by 5 guy ropes to the north and 5 to the south, at distances 3 m apart. Calculate the required length of each of the guy ropes.

