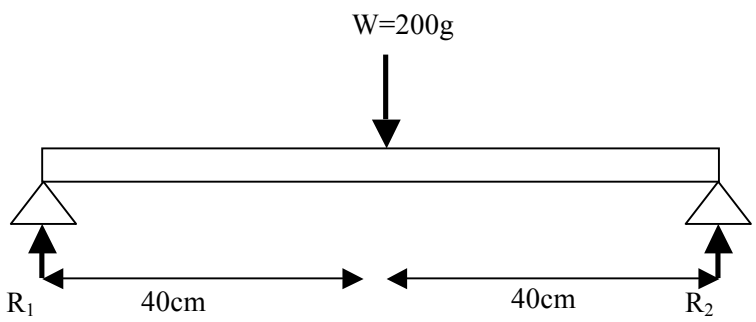
Bridges: Beam Bridge Forces

You are a bridge designer and you want to make sure that you can safely build a bridge at a particular location where the ground can withstand the required load. In order to do this you have decided to investigate how the reaction forces in a beam bridge vary according to the length of the bridge, how much load is applied and where it is placed.

1. First calculate the expected reaction forces of the different scenarios shown below, using moments to help you. Remember the force is the mass multiplied by $g=9.81m/s^2$ and 100g is equal to 0.1kg.

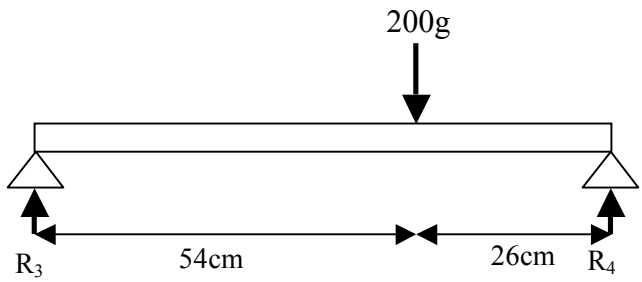


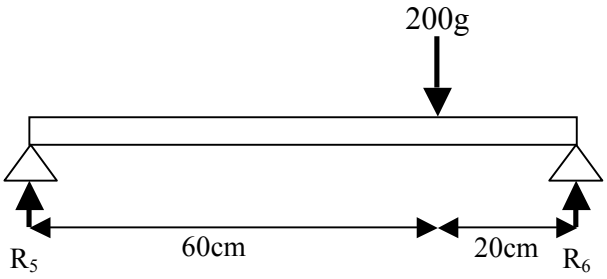
Taking moments about the R.H. support:

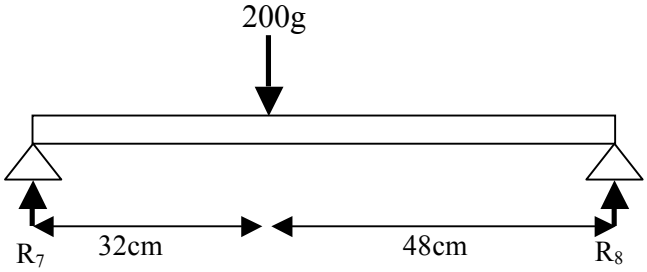
R_1 =

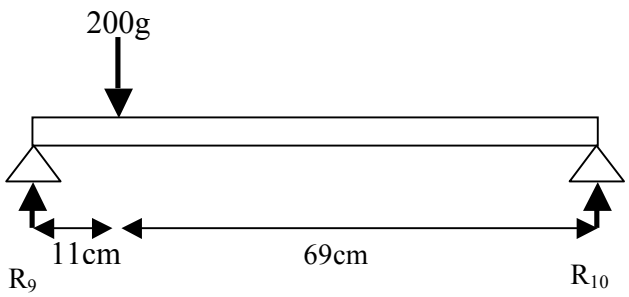
Taking moments about the L.H. support:

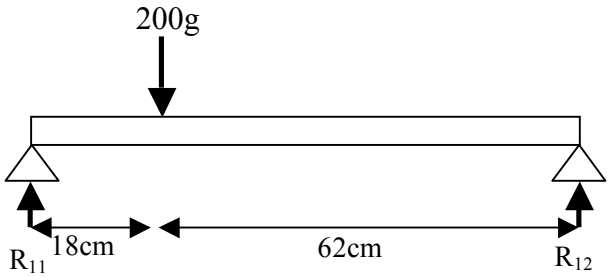
R_2 =

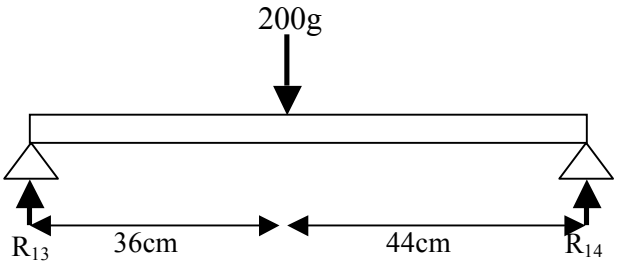



200g
R5
60cm
20cm
R6


200g
R7
32cm
48cm
R8


200g
11cm
69cm
R9
R10

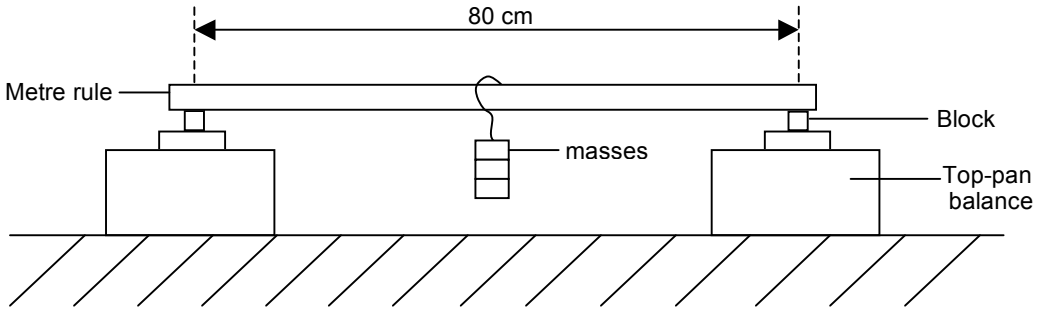

200g
18cm
62cm
R11
R12



Mass (kg)	Distance from L.H support (m)	Reaction Force 1 (N)	Reaction Force 2 (N)

2. Next, verify your answers using the apparatus shown below.

Apparatus Setup



3. Now repeat the experiments again but this time using 300g. Enter your data into the table above.