

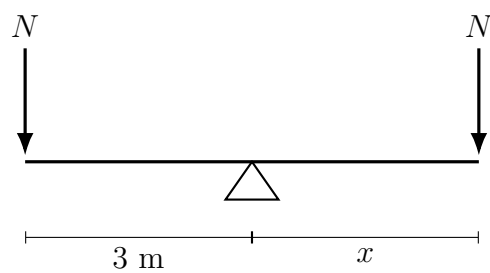
Test Series: Seesaw Equilibrium

Find the moment balance

In each problem, a seesaw rests on a support at its center and is in equilibrium. Equilibrium holds when the moments of the loads on both sides of the support, taken about the support, are equal.

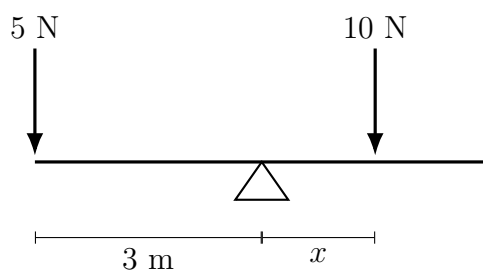
In each problem, solve for the unknown quantity (distance x , force X , or load value q).

Problem 1



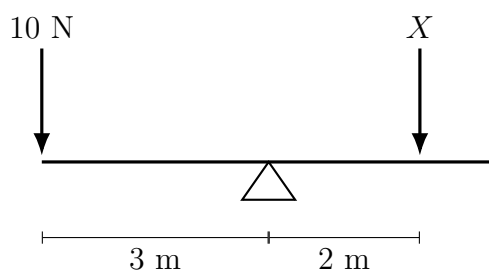
Two equal forces N . Solve for the distance x .

Problem 2



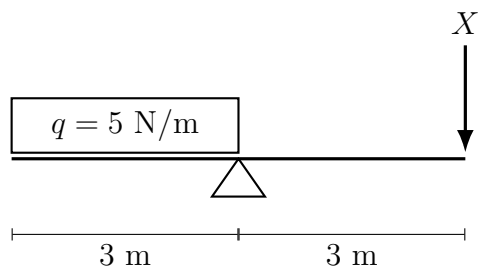
Solve for the distance x .

Problem 3



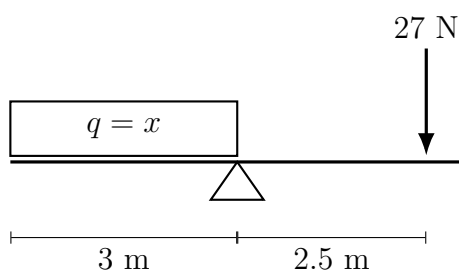
Solve for the force X .

Problem 4



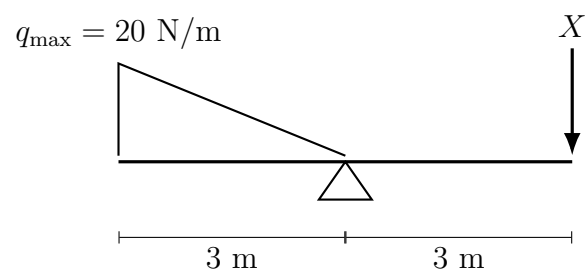
Solve for the force X .

Problem 5



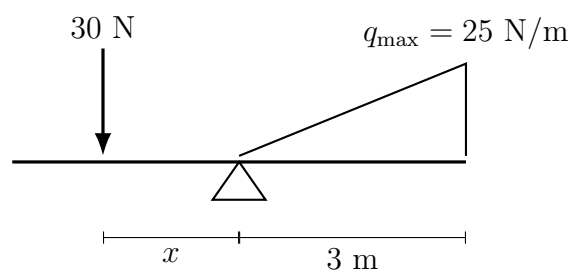
Solve for the load value q .

Problem 6



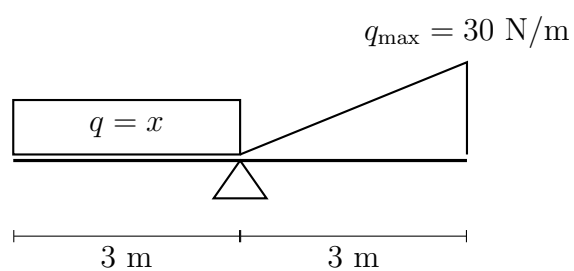
Solve for the force X .

Problem 7



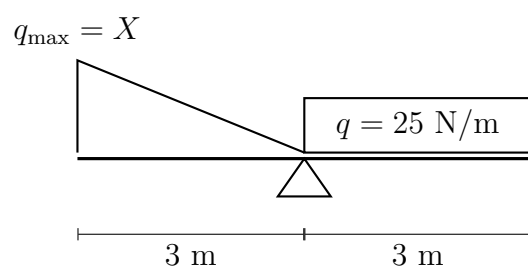
Solve for the distance x .

Problem 8



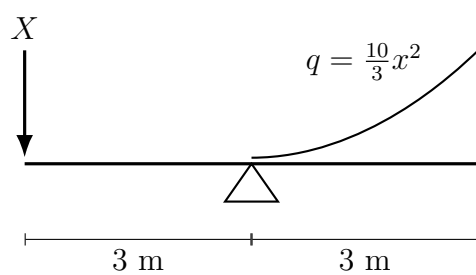
Solve for the load value q .

Problem 9



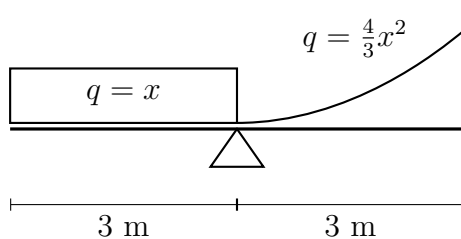
Solve for the maximum value X of the triangular load.

Problem 10



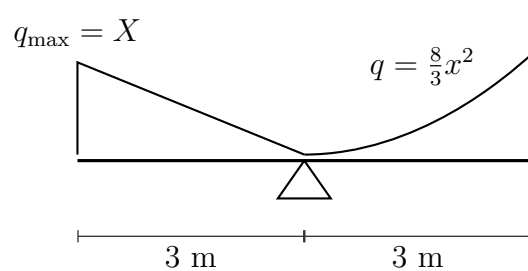
Solve for the force X . (x is measured from the support to the right, in meters.)

Problem 11



Solve for the value q of the uniform load. (x is measured from the support to the right, in meters.)

Problem 12



Solve for the maximum value X of the triangular load. (x is measured from the support to the right, in meters.)

Answers

1. $x = 3 \text{ m}$
2. $x = 1.5 \text{ m}$
3. $X = 15 \text{ N}$
4. $X = 7.5 \text{ N}$
5. $q = 15 \text{ N/m}$
6. $X = 20 \text{ N}$
7. $x = 2.5 \text{ m}$
8. $q = 20 \text{ N/m}$
9. $X = 37.5 \text{ N/m}$
10. $X = 22.5 \text{ N}$
11. $q = 6 \text{ N/m}$
12. $X = 18 \text{ N/m}$