

Lesson 6 - Hydraulics

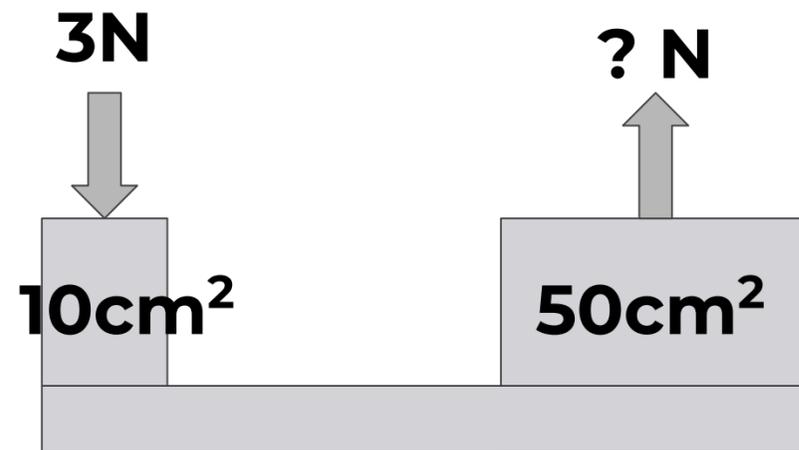
Physics - Key Stage 3

Matter

Mr McKee



What is the size of the force from the second cylinder?



Step 1 - how many times bigger or smaller is the area?

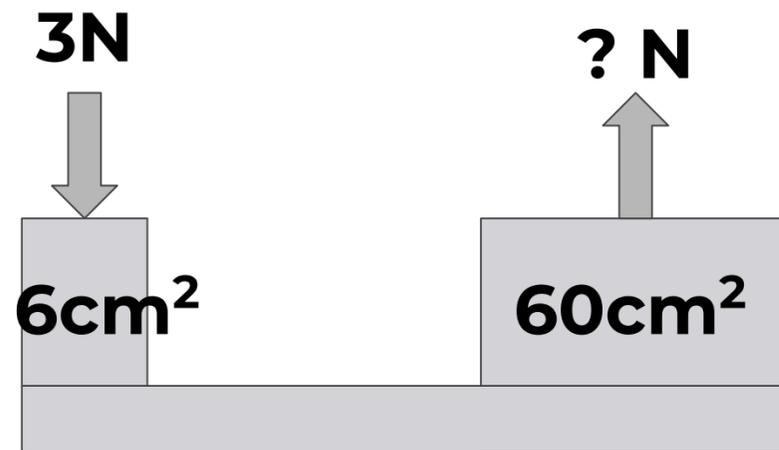
Area 2 to area 1 is,
 $50 \div 10 = 5$ times bigger.

Step 2 - multiply the force by that number

That means the force will increase by 5 times too. So multiply the force x 5
 $3\text{N} \times 5 = \underline{15 \text{ Newtons}}$.



What is the size of the force from the second cylinder?



Step 1 - how many times bigger or smaller is the area?

Area 2 to area 1 is..

$60 \div 6 = 10$ times bigger.

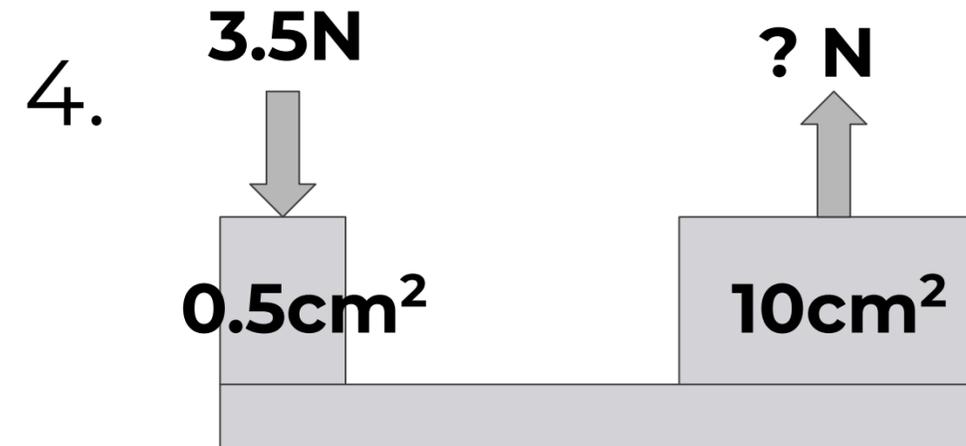
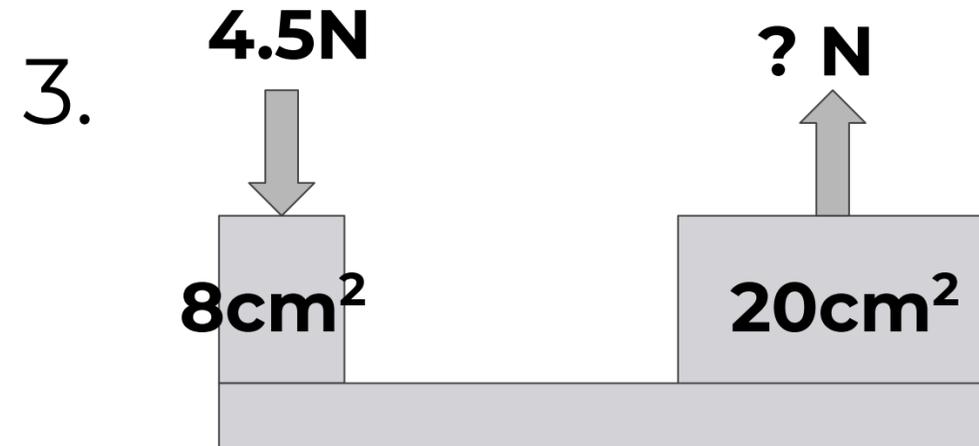
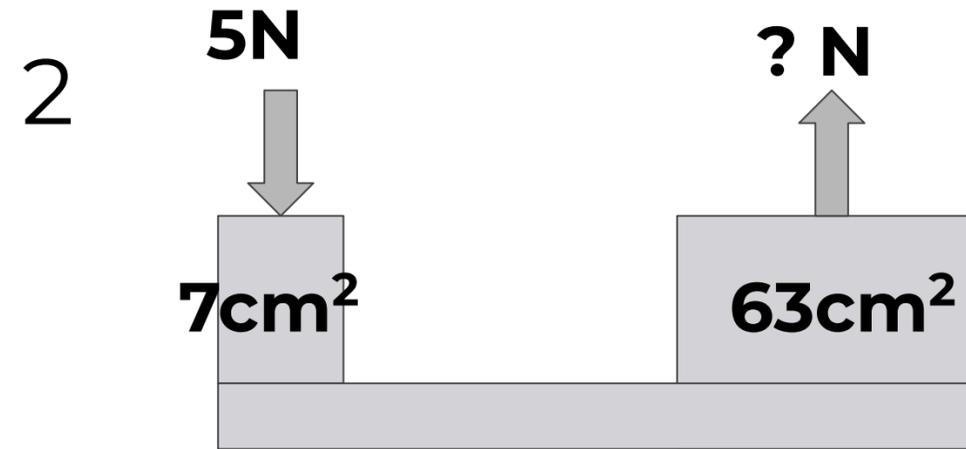
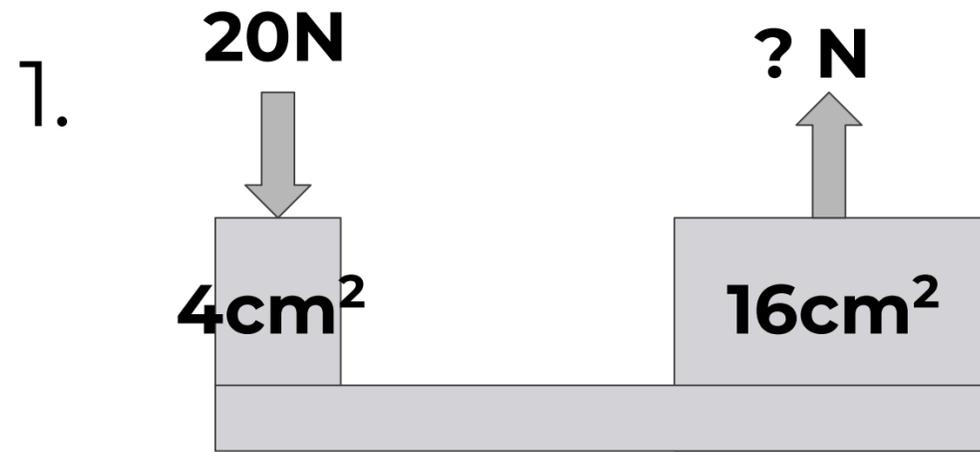
Step 2 - multiply the force by that number

That means the force will increase by 10 times too. So multiply the force x 10

$3\text{N} \times 10 = \underline{30 \text{ Newtons}}$.



Here's four for you to do



Calculation Question.

Question 1

- a. Calculate the pressure produced when a force of 200N is applied to an area of 20cm^2 .
- b. Calculate the force this acts with on a second cylinder with an area of 90cm^2 .

Question 2

- a. Calculate the pressure produced when a force of 350N is applied to an area of 15cm^2 .
- b. Calculate the force this acts with on a second cylinder with an area of 70cm^2 .



Three for you to do

Question 3

- Calculate the pressure produced when a force of 1000N is applied to an area of 50 cm².
- Calculate the force this acts with on a second cylinder with an area of 200cm².

Question 4

- Calculate the pressure produced when a force of 0.5N is applied to an area of 2 cm².
- Calculate the force this acts with on a second cylinder with an area of 50cm².

Question 5

- Calculate the pressure produced when a force of 0.5kN is applied to an area of 0.5m².
- Calculate the force this acts with on a second cylinder with an area of 2.4 m².



Independent practice: change the incorrect words to make the statement correct

1. A **volume** is applied to the first cylinder, which moves **up**
2. The cylinder exerts a pressure on the **gas**,
3. The liquid, which **can** compress, pushes through to the second cylinder.
4. The pressure is **different** throughout the system as it moves through.
5. This exerts **different** pressure on the second cylinder.
6. If the second cylinder has a larger **pressure**, it will magnify the **volume**.

