



Section A

1. Which correctly shows the equation that links pressure, force and area
Tick (✓) **one** box.

$$\text{Pressure} = \text{Force} \times \text{Area}$$

☐

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

☐

$$\text{Pressure} = \frac{\text{Area}}{\text{Force}}$$

☐

2. Which property of liquids makes them useful in hydraulic systems?
Tick (✓) **one** box.

They cannot be compressed

☐

They can be compressed

☐

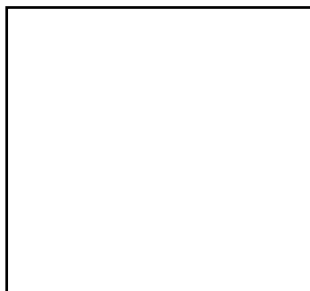
They do not have a fixed shape

☐

They can flow

☐

3. Draw a particle diagram to show the arrangement of particles in a liquid.



4. Using your particle diagram and your own knowledge, describe the movement of particles in a liquid.

Section B



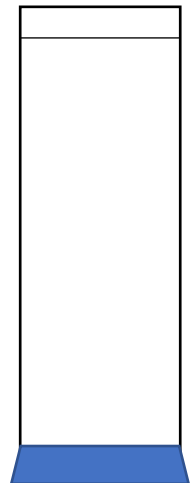
5. The diagram shows a container filled with water. The water exerts a force of 38 N on the bottom of the container.

The bottom of the container has a surface area of 0.005 m^2 .

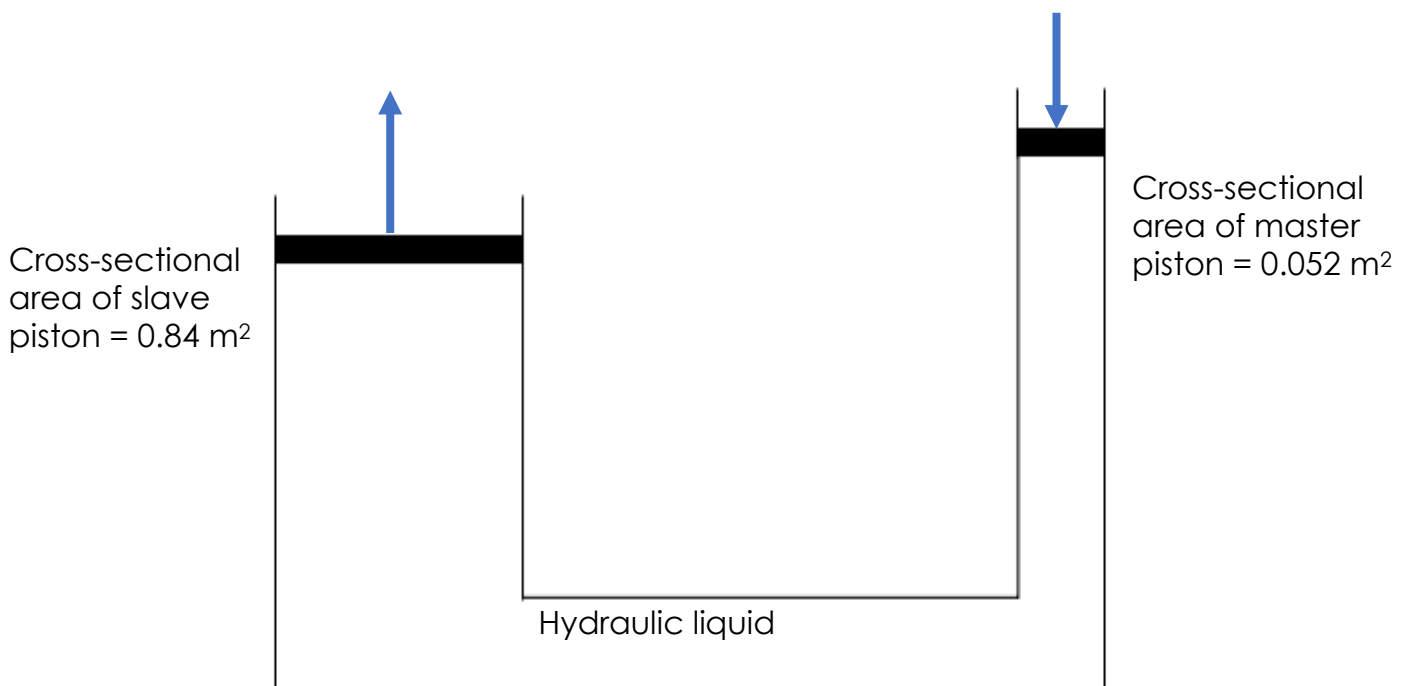
Calculate the pressure exerted by the water on the bottom of the container.

Circle the correct unit.

m^2/N	Nm	Pa
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6. The diagram below shows the hydraulic system used in a car lift. An operator presses a control button which applies a force to the master piston. This makes the slave piston produce a force acting upwards, which lifts the car.



- a. When a force is applied to the master piston, it results in a much larger force acting upwards on the car. Use information from the diagram to explain why.



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- b. A force of 990 N is applied to the master piston. Calculate the force applied by the hydraulic liquid to the slave piston.

- c. Calculate the maximum mass of a car that could be lifted by this car lift. Take gravitational field strength as 10 N/kg.

Section C

7. Hydraulic systems are also used in car braking systems.
- Explain why hydraulic brakes contain fluid.
 - Compare the size of the force applied by a person's foot to the brake and the force applied by the brakes on the wheels.
 - Sketch a velocity-time graph to show a car moving at a steady speed before the driver applies the brake and slows down to a stop.

