2 (a) Figure 2 shows a tank for holding water.

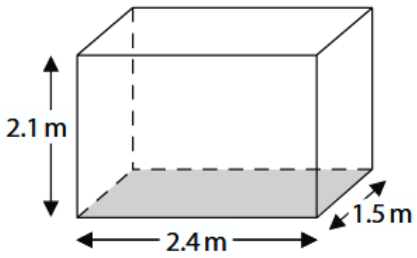


Figure 2

The tank has sides of 2.4 m, 2.1 m and 1.5 m.

The pressure at the bottom of the tank is 12 kPa.

(i) State the equation relating pressure, force and area.

(1)

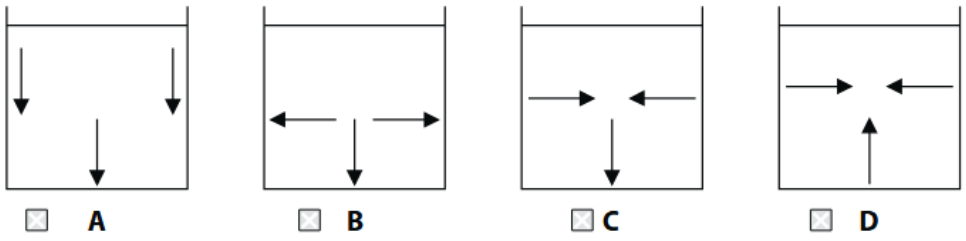
(ii) Calculate the weight of water in the tank.

(4)

weight = ... N

(iii) Which diagram shows the direction of the forces from the water on the inside of the tank?

(1)



(b) Figure 3 shows three containers A, B, and C.

Each container contains a liquid, as shown.

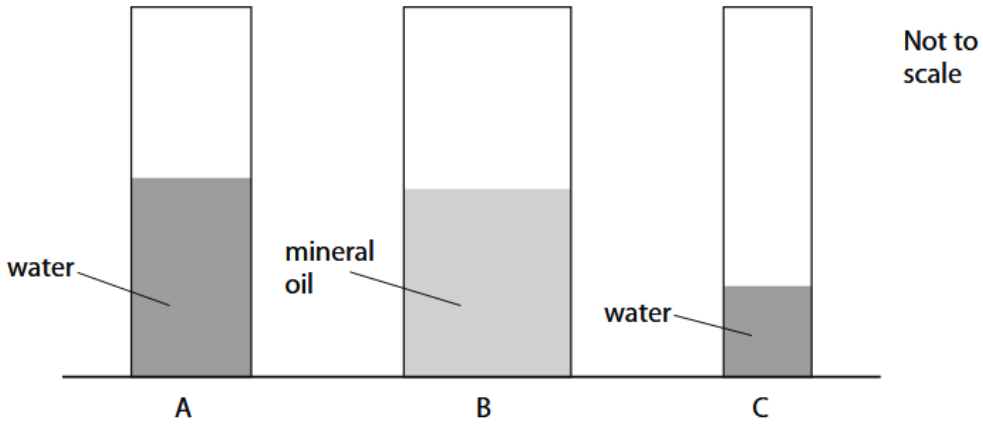


Figure 3

Figure 4 gives some data about the liquids and containers.

container	area of base (cm^2)	name of liquid	density of liquid (g/cm^3)	depth of liquid in container (cm)
A	16	water	1.00	50.00
B	32	mineral oil	0.91	50.00
C	12	water	1.00	25.00

Figure 4

Explain which container has the highest pressure at the bottom, and which container has the lowest.

Use information from Figure 3 and Figure 4.

(3)

(Total for Question 2 = 9 marks)

Question number	Answer	Mark
2(a)(i)	pressure = force ÷ area	(1)

Question number	Answer	Additional guidance	Mark
2(a)(ii)	rearrangement (1) (F =) $P \times A$ calculation of area (1) 2.4 × 1.5 = 3.6 substitution (1) (F =) 12 000 × 3.6 answer (1) 43 200 (N)	award full marks for correct numerical answer without working maximum 3 marks if kPa not converted to Pa	(4)

Question number	Answer	Mark
2(a)(iii)	B	(1)

Question number	Answer	Additional guidance	Mark
2(b)	An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (2 marks): • pressure in A is the highest and pressure in C is the lowest (pressure in B is between them) (1) • pressure depends on depth of liquid (so) can compare A and C because same liquid (hence) pressure in A is twice that of C (1) • pressure depends on density of liquid (so) can compare A and B since same depth hence pressure in A greater than pressure in B (1)	allow a mathematical approach, i.e. calculating all three pressures from the relevant data	(3)