

Question number	Answer	Notes	Marks
9 (a)	<p>downward arrow labelled weight;</p> <p>upward arrow of equal length to downward arrow (by eye);</p>	<p>ignore starting position of arrows</p> <p>horizontal arrows</p> <p>allow <u>force</u> of gravity</p> <p>ignore label on upward force</p>	2
(b) (i)	pressure difference = height x density x g	<p>allow in standard symbols or in words e.g.</p> <p>$p = h \times \rho \times g$</p> <p>condone d for density</p>	1
(ii)	<p>substitution;</p> <p>answer seen in pascals / conversion to kPa;</p> <p>e.g.</p> <p>(P =) $48 \times 1030 \times 10$</p> <p>(P =) 490 000 (Pa)</p>	<p>allow use of $g=9.8$</p> <p>allow $\div 1000$ seen anywhere</p> <p>1 mark max for RA</p> <p>allow 494 400, 500 000 (Pa)</p>	2
(c) (i)	600 (kPa);	<p>allow 594.4, 594, 590 (kPa)</p> <p>ecf from (b)(ii)</p>	1
(ii)	<p>substitution into $p_1V_1 = p_2V_2$;</p> <p>rearrangement;</p> <p>evaluation;</p> <p>e.g.</p> <p>$100 \times 24 = 600 \times V_2$</p> <p>$V_2 = 100 \times 24 / 600$</p> <p>($V_2 =$) 4.0 ($\text{m}^3$)</p>	<p>ecf from (c)(i)</p> <p>-1 for POT error</p> <p>allow 2 marks max for use of 500 (kPa) as final pressure, giving 4.8 m^3</p> <p>allow answers in range 4.0 - 4.1 (m^3)</p>	3

Total for question 9 = 9 marks