1) C
2) B
3) A
4)

(a)		$m = \rho V$	B1	**[1]**
(b)		pressure in liquid depends on depth	B1	
		bottom of sphere has greater pressure on it than top	M1	
		so resultant force or pressure is upwards	A1	**[3]**

5)

(a)	**(i)**	mass / volume …(ratio must be clear).....	B1	
	(ii)	$kg\ m^{-3}$ OR kg / m^3	B1	[2]
(b)		v has unit of $m\ s^{-1}$	B1	
		p / ρ has unit of $kg\ m^{-1}\ s^{-2}$ / $kg\ m^{-3}$ (no e.c.f. from (a))	M1	
		$\sqrt{(p / \rho)}$ has unit of $m\ s^{-1}$	A1	
		LHS = RHS so γ has no unit	A0	[3]

6)

(a)	**(i)**	force per unit area (ratio idea essential)	B1	
	(ii)	$kg\ m^{-1}\ s^{-2}$	B1	**[2]**
(b)		ρ has base unit $kg\ m^{-3}$	B1	
		g has base unit $m\ s^{-2}$	B1	
		$h\rho g$ has base unit $m \times kg\ m^{-3} \times m\ s^{-2}$	M1	
		same as pressure QED	A0	**[3]**

7)

(a)		mass per unit volume (*ratio idea must be clear, not units*)	B1	**[1]**
(b)	**(i)**	pressure is same at the surface of mercury because at same horizontal level	B1	**[1]**
	(ii)	$h\rho g$ is same for both	B1	
		$53 \times 10^{-2} \times 1.0 \times 10^3 \times g = 71 \times 10^{-2} \times \rho \times g$	C1	
		$\rho = 7.5 \times 10^2\ kg\ m^{-3}$	A1	[3]

8)

(a)	**(i)**	**1.** stress = force / (cross-sectional) area	B1	[1]
		2. strain = extension / original length	B1	[1]
		3. Young modulus = stress / strain	B1	[1]
		(ratios must be clear in each answer)		
	(ii)	*either* fluids cannot be deformed in one direction / cannot be stretched		
		or fluids can only have volume change		
		or no fixed shape	B1	[1]
(b)	*either*	unless Δp is very large *or* 2.2×10^9 is a large number	M1	
		ΔV is very small *or* $\Delta V/V$ is very small, (so 'incompressible')	A1	[2]
(c)	$\Delta p = h\rho g$			
	$1.01 \times 10^5 = h \times 1.08 \times 10^3 \times 9.81$		C1	
	$h = 9.53$ m		C1	
	$\Delta h / h = 0.47 / 10$ *or* $0.47 / 9.53$			
	error = 4.7% *or* 4.9% *or* 5%		A1	[3]