

## PHYS 1303 Practice

### Halliday 14.1-14.10

1. What fraction of an iceberg is submerged? ( $\rho_{\text{ice}} = 917 \text{ kg/m}^3$ ,  $\rho_{\text{sea}} = 1025 \text{ kg/m}^3$ )
2. A hydraulic lift raises a 2000-kg automobile when a 500-N force is applied to the smaller piston. If the smaller piston has an area of  $10.0 \text{ cm}^2$ , what is the cross-sectional area of the larger piston?
3. Water is flowing at  $4.0 \text{ m/s}$  in a pipe of circular cross-section. If the diameter of the pipe decreases to  $\frac{1}{2}$  its former value, what is the velocity of the water now?
4. A Boeing 737 airliner has a mass of 20,000 kg and the total area of both wings (top or bottom) is  $100 \text{ m}^2$ . If the average of the airspeed above and below the wing is 500 miles per hour when the airplane is cruising in air of density  $1.0 \text{ kg/m}^3$ , what must be the difference in air speed between the top and bottom surface of each wing if they have thickness  $1.0 \text{ m}$ ? [*use 1 mile = 1.6 km*]

### Answers

1. 89%
2.  $392 \text{ cm}^2$
3.  $16 \text{ m/s}$
4.  $8.8 \text{ m/s}$  (out of  $250 \text{ m/s}$  airplane speed)