

## AREA AND VOLUME

Form 1

Vol 7

### Part 8B – Water Problem (B)

1. Let the required depth be  $h$  cm.

$$\text{Volume of water} = \frac{(7+9)h}{2} \times 6 = \frac{(7+11) \times 4}{2} \times 4 = 144 \text{ cm}^3$$

$$h = 3$$

2. Let the required depth be  $h$  cm.

$$\text{Volume of water} = \left[ \frac{(4+1+1)(3)}{2} + 4 \times (4+2.5) \right] h = \left[ \frac{(4+1+1)(3)}{2} + 4 \times 4 \right] \times 5$$

$$35h = 125$$

$$h = \frac{25}{7} \approx 3.57$$

3. (a) Volume of water =  $\left[ \frac{(12+16)(8-2)}{2} + 16 \times 2 \right] \times 4.5 = 522 \text{ m}^3$

- (b) In figure B, the capacity of the container under level 6 m

$$= \frac{(12+16)(8-2)}{2} \times 6 = 504 \text{ m}^3$$

There are  $522 - 504 = 18 \text{ m}^3$  water above level 6 m.

$$\text{Thus, the required water level} = 6 + \frac{18}{16 \times 6} = 6.1875 \text{ m} \quad \left( \text{or } \frac{99}{16} \text{ m} \right)$$

## Part 9A – Surface Area (A)

- Total surface area of the cube =  $6y^2 = 96 \text{ cm}^2$   
 $y = 4$
- The total surface area =  $(3+5+7+6.4)(4) + \frac{(3+7)(5)}{2} \times 2 = 135.6 \text{ cm}^2$
- The total surface area =  $2(7+2+6)(4) + 2[7(2+6) - 6(7-3)] = 184 \text{ cm}^2$
- The total surface area =  $[2(15+10) + 2(6)](8) + 2[10 \times 15 - 6(15-2x)] = 664 \text{ cm}^2$   
 $496 + 120 + 24x = 664$   
 $x = 2$
- Let the required perimeter be  $p$  cm.  
Total surface area of the prism =  $4p + 2(15) = 150 \text{ cm}^2$   
 $p = 30$
- The total surface area =  $4 \times 4 \times 6 = 96 \text{ cm}^2$
  - The volume =  $4^3 - 1^3 = 63 \text{ cm}^3$
- The capacity =  $5 \times 4 \times 6 = 120 \text{ m}^3$
  - The wet surface area =  $2(4+6)(5)\left(\frac{1}{3}\right) + 4 \times 6 = \frac{172}{3} \approx 57.3 \text{ m}^2$
- The volume =  $\{12 \times 6 - (12 - 2 - 2)[6 - (8 - 5)]\} \times 9 = 432 \text{ m}^3$
  - The wet surface area  
=  $\{12 + 2 \times 6 + 2 \times [6 - (8 - 5)] + (12 - 2 - 2)\} \times 9 + 2\{12 \times 6 - (12 - 2 - 2)[6 - (8 - 5)]\}$   
=  $342 + 96$   
=  $438 \text{ m}^2$