

## Solutions to Past Paper Questions – Area and Volume of Similar Shapes

24) Ratio of lengths =  $4:8 = 1:2$

(a) So ratio of areas =  $1^2:2^2 = 1:4$   
Surface area of B =  $80 \times 4 = 320\text{cm}^2$

(b) Ratio of volumes =  $1^3:2^3 = 1:8$   
Volume of A =  $600 \div 8 = 75\text{cm}^3$

20) Ratio of Surface areas =  $24:96 = 1:4$

(a) Ratio of lengths =  $\sqrt{1}:\sqrt{4}=1:2$   
Height of cone Q =  $4 \times 2 = 8\text{cm}$

(b) Ratio of volumes =  $1^3:2^3 = 1:8$   
Volume of cone Q =  $12 \times 8 = 96\text{cm}^3$

16) Ratio of lengths =  $4:6 = 2:3$

So ratio of volumes =  $2^3:3^3 = 8:27$

Volume of cylinder B =  $80 \times \frac{27}{8} = 270\text{ cm}^3$

21) Ratio of volumes =  $27:125$

So ratio of lengths =  $\sqrt[3]{27}:\sqrt[3]{125}=3:5$

So ratio of areas =  $3^2:5^2 = 9:25$

Surface area of larger solid =  $36 \times \frac{25}{9} = 100\text{ cm}^2$

12) Ratio of lengths =  $20:30 = 2:3$

Ratio of areas =  $2^2:3^2 = 4:9$

Surface area of larger frustum =  $450 \times \frac{9}{4} = 1012.5\text{ cm}^2$

23) Ratio of volumes =  $12000:49152 = 125:512$

Ratio of lengths =  $\sqrt[3]{125}:\sqrt[3]{512}=5:8$

Ratio of areas =  $5^2:8^2 = 25:64$

Surface area of larger prism =  $9728 \times \frac{25}{64} = 3800\text{ cm}^2$