# Curriculum Outcome

**M1 Demonstrate an understanding of the Système International (SI) by describing the relationships of the units for length, area, volume, capacity, mass and temperature.**

**M2 Demonstrate an understanding of the Imperial system by: describing the relationships of the units for length, area, volume, capacity, mass and temperature.**

**M3 Solve problems, using SI and Imperial units, that involve linear measurement using estimation and measurement strategies.**

Student Friendly: The relationship between area and volume such as

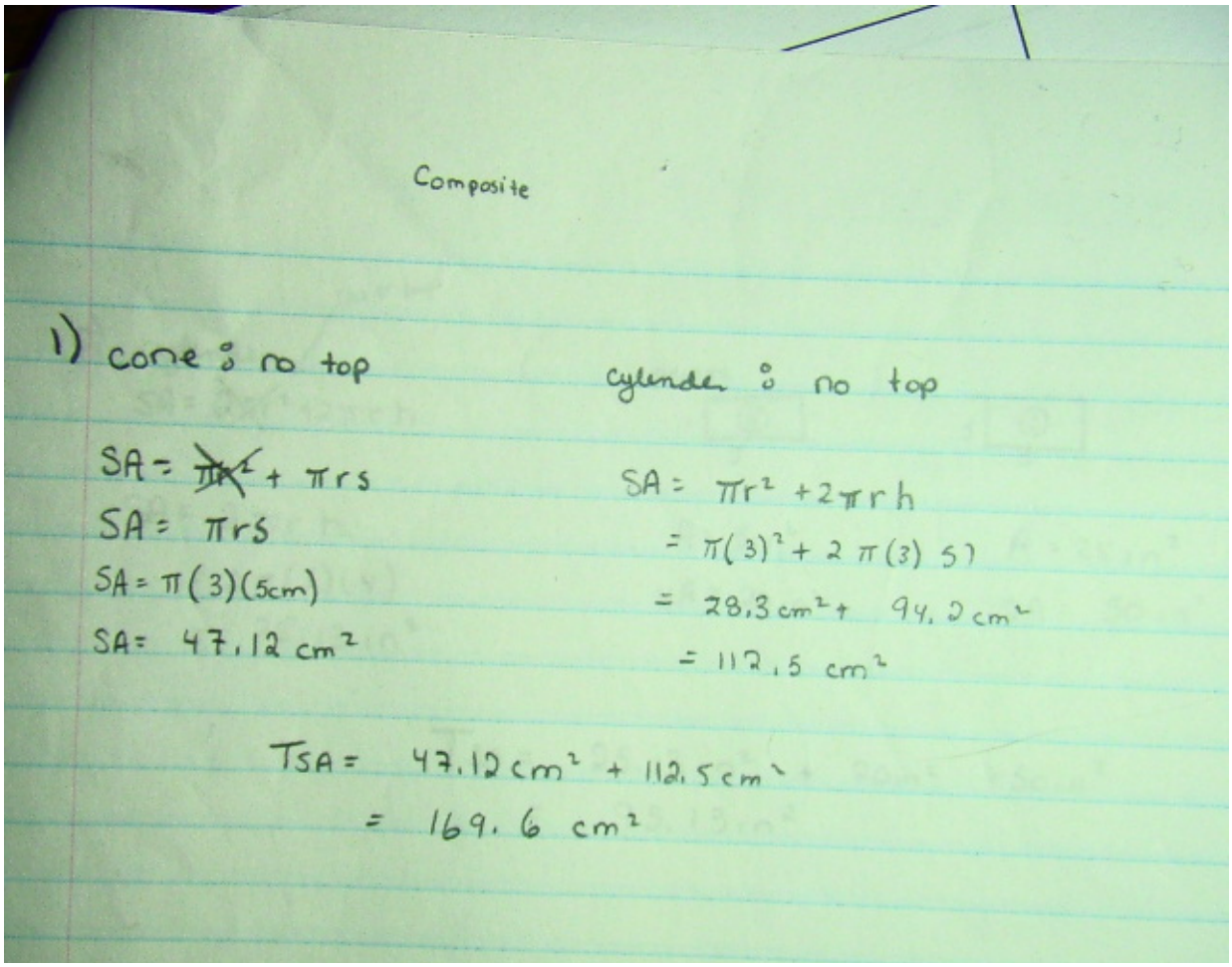
1 m = 1.0936 yd

1 m = 3.2808 ft

1 mi= 1.6093 km

1 in = 2.54 cm


Volume



Composite

1) cone ∘ no top

$SA = \cancel{\pi r^2} + \pi rs$

$SA = \pi rs$

$SA = \pi(3)(5cm)$

$SA = 47.12\ cm^2$

cylinder ∘ no top

$SA = \pi r^2 + 2\pi rh$

$= \pi(3)^2 + 2\pi(3)(5)$

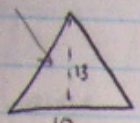
$= 28.3\ cm^2 + 94.2\ cm^2$

$= 112.5\ cm^2$

$TSA = 47.12\ cm^2 + 112.5\ cm^2$

$= 169.6\ cm^2$

b)

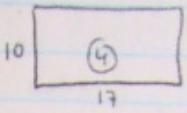



$A = \frac{b \times h}{2}$

$A = \frac{10 \times 13}{2}$

$A = 65\ ft^2$

$4A = 260\ ft^2$

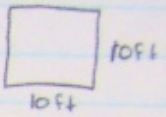



$A = b \times h$

$A = 10 \times 17$

$A = 170\ ft^2$

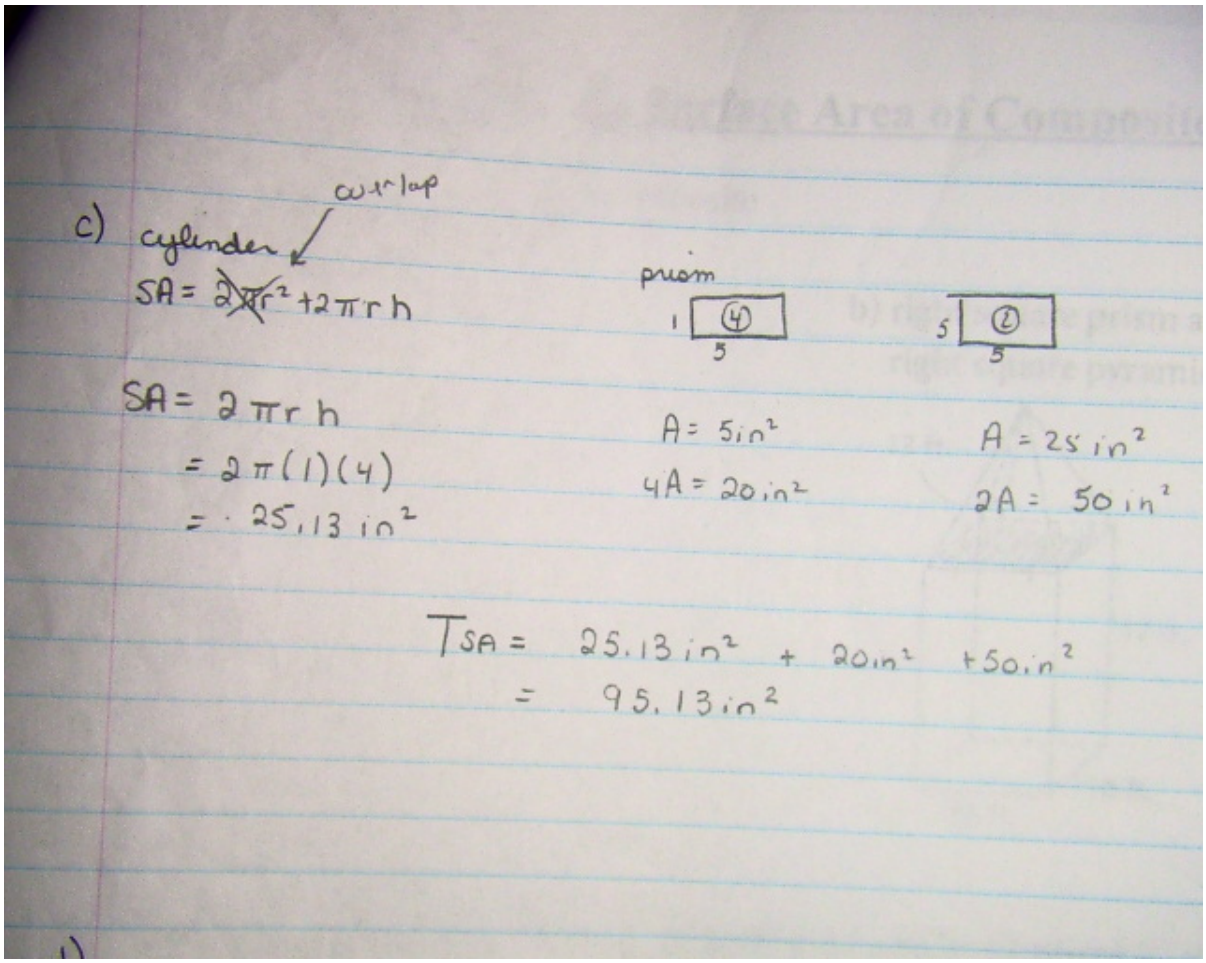
$4A = 680\ ft^2$




$A = 100\ ft^2$

$TSA = 260 + 680 + 100$

$= \boxed{1040\ ft^2}$


c)
overlap
cylinder
$SA = 2\pi r^2 + 2\pi r h$
$SA = 2\pi r h$
$= 2\pi(1)(4)$
$= 25.13\ in^2$
prism
1
4
5
$A = 5\ in^2$
$4A = 20\ in^2$
5
2
5
$A = 25\ in^2$
$2A = 50\ in^2$
$TSA = 25.13\ in^2 + 20\ in^2 + 50\ in^2$
$= 95.13\ in^2$

d) sphere

$SA = 4\pi r^2$

$= 4\pi(4)^2$

$= 201.1\ in^2$

$\frac{1}{2} SA = 100.5\ in^2$

cone

$SA = \pi r^2 + \pi r s$

$= \pi r s$

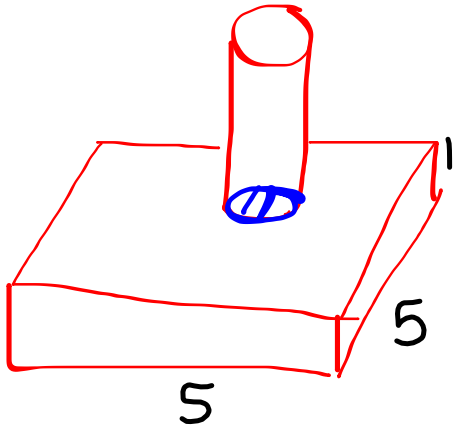
$= \pi(4in)(17in)$

$= 213.6\ in^2$

$T_{SA} = 100.5\ in^2 + 213.6\ in^2$

$= 314.13\ in^2$

1c)




Cylm

$SA = \cancel{2\pi r^2} + 2\pi \cdot h$

$SA = 2\pi(1)(4)$

$SA = 25.13\ in^2$

Prism

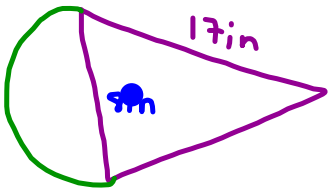
$SA = 2(lw) + 2(wh) + 2(hl)$

$= 2(5\times5) + 2(5\times1) + 2(5\times1)$

$= 70\ in^2$

$TSA = 25.13\ in^2 + 70\ in^2$

$= 95.13\ in^2$




Sph

$SA = 4\pi r^2$

$\frac{1}{2} SA = 2\pi r^2$

$= 2\pi(4in)^2$

$= 100.5\ in^2$

Cone

$SA = \pi r^2 + \pi r s$

$SA = \pi r s$

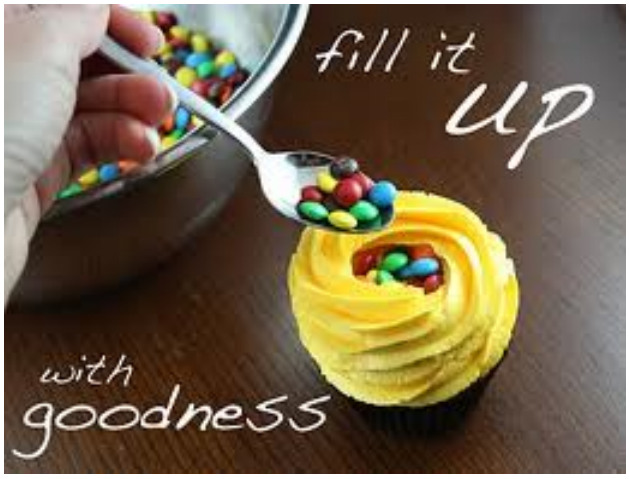
$= \pi(4in)(17in)$

$= 213.6\ in^2$

$T_{SA} = 100.5\ in^2 + 213.6\ in^2$

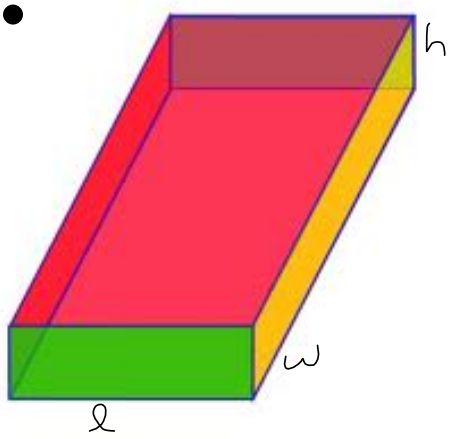
$= 314.13\ in^2$

Capacity - the maximum amount a container can hold




Volume - the amount of space a solid occupies

Elementary School

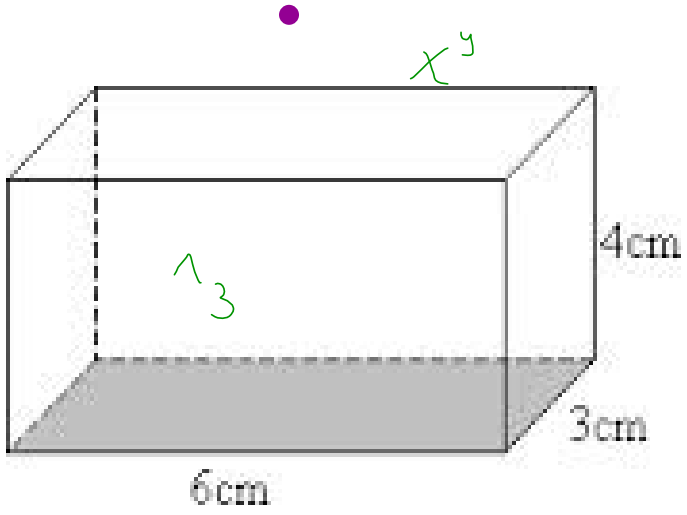



$V = A_{base} \times h$

$V = (L \times W) \times H$


# High School

Volume of Prism: $V = A_{base} \times \text{Height}$




$V = \ell w h$

$V = 4 \times 3 \times 6$

$V = 72\ cm^3$

$72\ cm^3 \times \frac{1\ m\ell}{1\ cm^3} = 72\ m\ell$

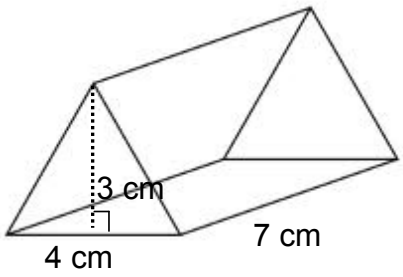
$25\ in^3 = \_\_\_\_\_\ \frac{ml}{L}$

$25\ in^3 \left[\frac{2.54\ cm}{1\ in}\right]^3 \times \frac{1\ ml}{1\ cm^3}$

$= 409.8\ ml$

# Volume of Prism:

$V = A_{base} \times \text{Height}$

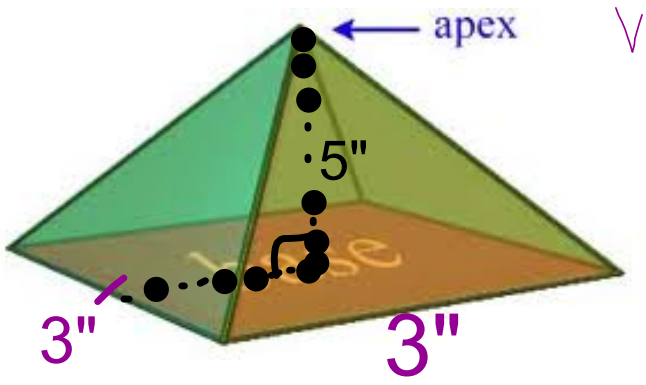



$V = \left(\frac{b \times h}{2}\right) \times H$

$V = \left[\frac{(4\text{cm})(3\text{cm})}{2}\right] \times 7\text{cm}$

$V = 42\ \text{cm}^3$

Volume of Pyramid: $V = \frac{A_{base} \times Height}{3}$



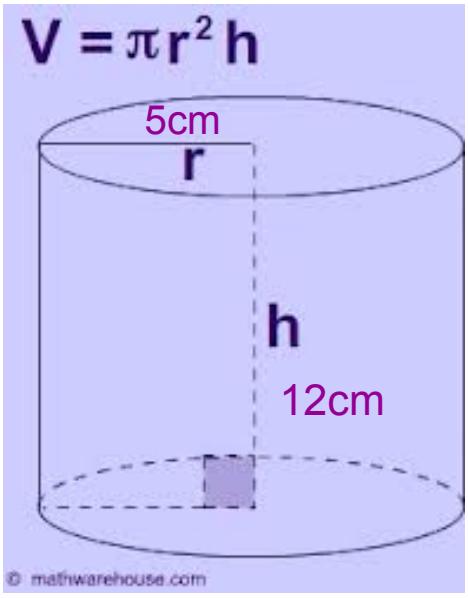

$V = \frac{(b \times h) \times H}{3}$

$V = \frac{(3 \times 3) \times 5}{3}$

$V = 15 \text{ in}^3$

Volume of Cylinder: $V = A_{base} \times \text{Height}$

$= \pi r^2 \times h$

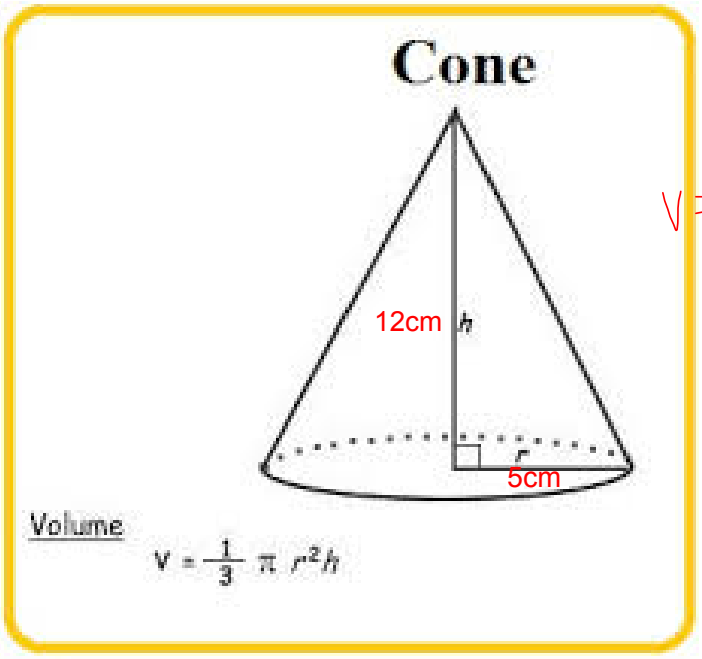



$V = \pi (5)^2 \times 12$

$V = 942.5 \text{ cm}^3$

Volume of Cone: $V = \frac{A_{base} \times Height}{3}$

$= \frac{\pi r^2 \times h}{3}$



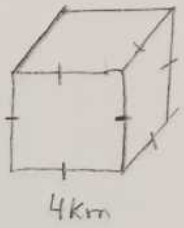

$V = \frac{\pi (5)^2 \times (12)}{3}$

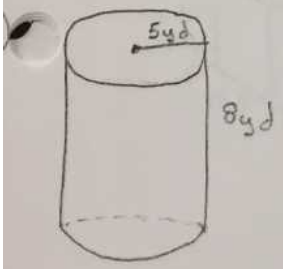
$V = 314.16 \text{ cm}^3$

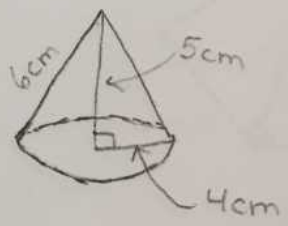
Exercise 8

Calculate the volume for each of the following shapes in cubic centi metres.

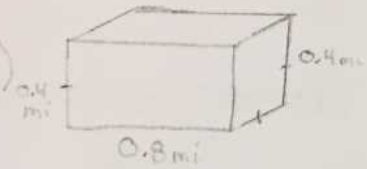
a) 


b) 

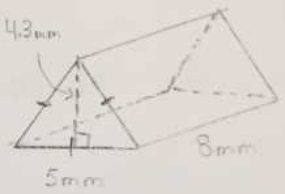



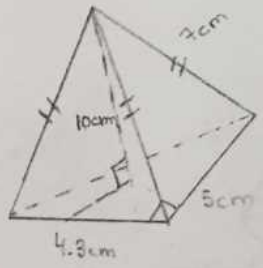

d) 

e)

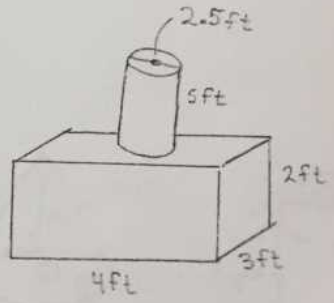

0.4 mi
0.4 mi
0.8 mi

f)


4.3mm
8mm
5mm


7cm
10cm
5cm
4.3cm

g)


2.5ft
5ft
2ft
3ft
4ft

## Attachments

GMF_10_-_Chp._4_Tables_and_Formulas.docx

Worksheet - Converting Capacity in Imp.docx

Worksheet - Converting Volumes Imp_Metric.docx