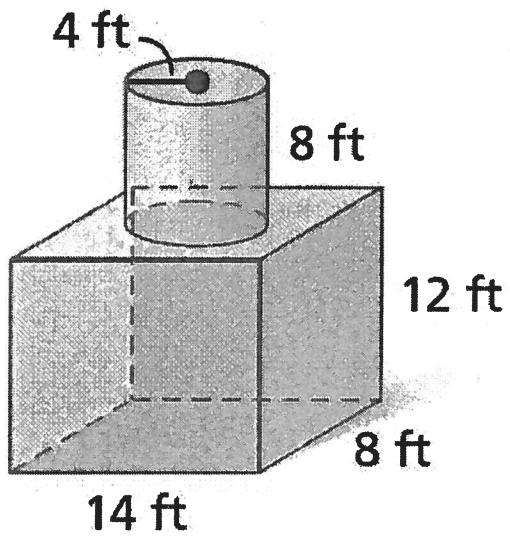
KEY

First Name:_____ Last Name:_____

L04 – Worksheet – Volume and Volume Unit Conversions

Q1: Calculate the volume of the composite shape, to the nearest cubic foot.

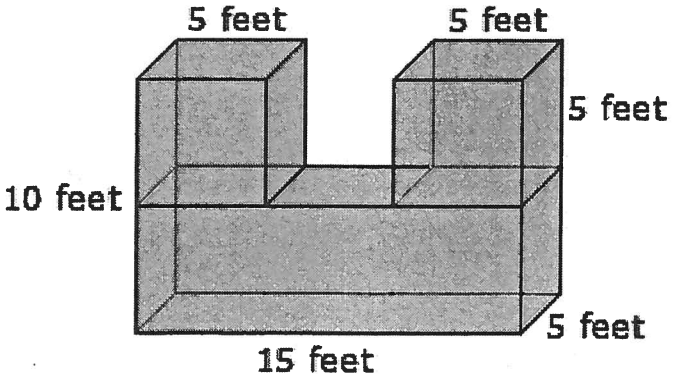


Vol of Top = (Area of Base) × Height
$= (\pi r^2) \times \text{Height}$
$= (\pi \cdot 4^2) \times 8$
$= 402.12\ ft^3$

Vol of Bottom = (Area of Base) × Height
$= (14 \times 8) \times 12$
$= 1344\ ft^3$

TOTAL VOL = $\boxed{1746.12\ ft^3}$

Q2: Calculate the volume of the composite shape, to the nearest cubic centimeter.



Vol of small cube = (Area of Base) × Height
$= (5 \times 5) \times 5$
$= 125\ ft^3$

Vol of small cube = $125\ ft^3$

Vol of bottom = (Area of Base) × Height
$= (15 \times 5) \times 5$
$= 375\ ft^3$

TOTAL VOL = $\boxed{625\ ft^3}$

$$\frac{625\ ft^3}{1} \times \frac{30.48\ cm}{1\ ft} \times \frac{30.48\ cm}{1\ ft} \times \frac{30.48\ cm}{1\ ft} = \boxed{17,698,029.12\ cm^3}$$

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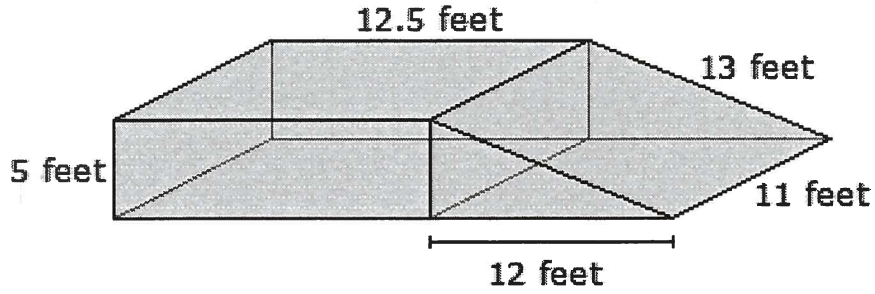
Q3: Calculate the volume of the composite shape, to the nearest cubic meter.



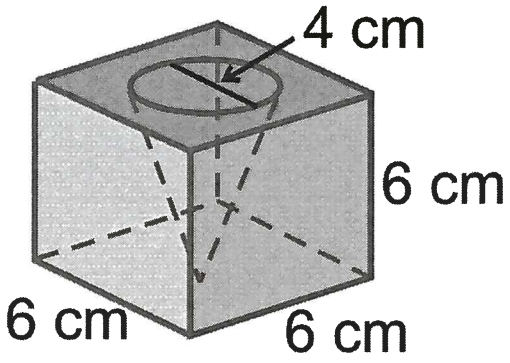
VOL OF LEFT = (Area of Base) × Height
= (12.5 × 11) × 5
= 687.5 ft^3

VOL OF RIGHT = (Area of Base) × Height
= $\left(\frac{12 \times 5}{2}\right) \times 11$
= 330 ft^3

TOTAL VOL = 1017.5 ft^3
Plan: ft → cm → m

$$\frac{1017.5\ ft^3}{1} \times \frac{30.48\ cm}{1\ ft} \times \frac{30.48\ cm}{1\ ft} \times \frac{30.48\ cm}{1\ ft} \times \frac{1\ m}{100\ cm} \times \frac{1\ m}{100\ cm} \times \frac{1\ m}{100\ cm} = \boxed{28.81\ m^3}$$

Q4: Calculate the volume of the composite shape, to the nearest cubic millimeter.



VOL OF CUBE = (Area of Base) × Height
= (6×6) × 6
= 216 cm^3

VOL OF CONE = $\frac{\text{(Area of Base)} \times \text{Height}}{3}$
= $\frac{(\pi \cdot 2^2) \times 6}{3}$
= 25.13 cm^3

TOTAL AREA = $\boxed{190.87\ cm^3}$

$$\frac{190.87\ cm^3}{1} \times \frac{10\ mm}{1\ cm} \times \frac{10\ mm}{1\ cm} \times \frac{10\ mm}{1\ cm} = \boxed{190,867\ mm^3}$$

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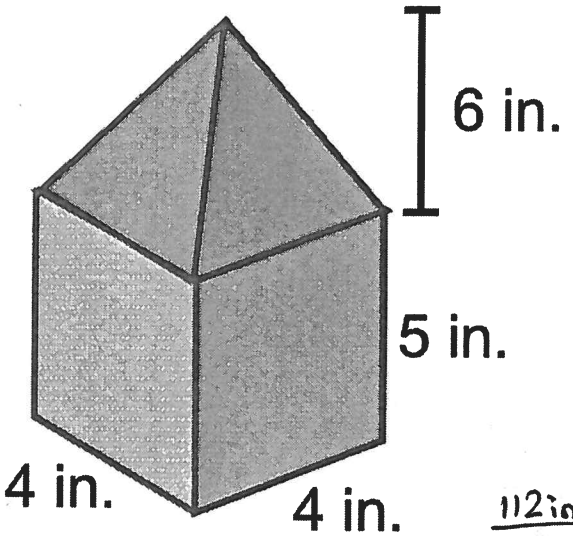
Q5: Calculate the volume of the composite shape, to the nearest cubic centimeter.



Vol of Top = $\frac{(\text{Area of base}) \times \text{Height}}{3}$

$= \frac{(4 \times 4) \times 6}{3}$

$= 32 \text{ in}^3$

Vol of Bottom = (Area of Base) × Height

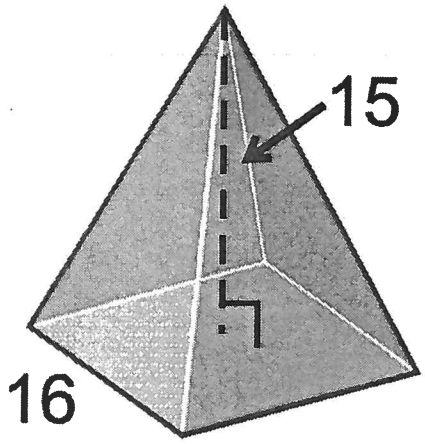
$= (4 \times 4) \times 5$

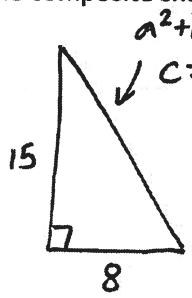
$= 80 \text{ in}^3$

TOTAL VOL = $\boxed{112 \text{ in}^3}$

$\frac{112 \text{ in}^3}{1} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = \boxed{1835.4 \text{ cm}^3}$

Q6: Calculate the volume and surface area of the composite shape.





Area of bottom = $16 \times 16 = 256$

Area of side = $\frac{16 \times 17}{2} = 136$

Area of bottom + 4 sides gives $\boxed{800 \text{ units}^2}$

VOL = (Area of Base) × Height

$= (16 \times 16) \times 15$

$= \boxed{3840 \text{ units}^3}$

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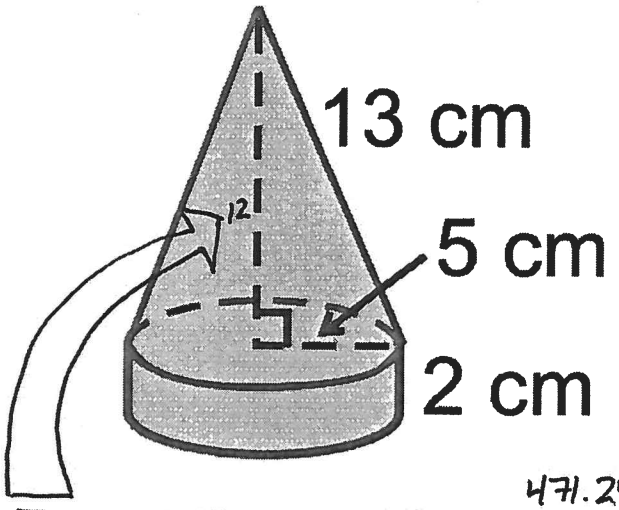
Q7: Calculate the surface area and volume of the composite shape to the nearest square inch and cubic inch, respectively.

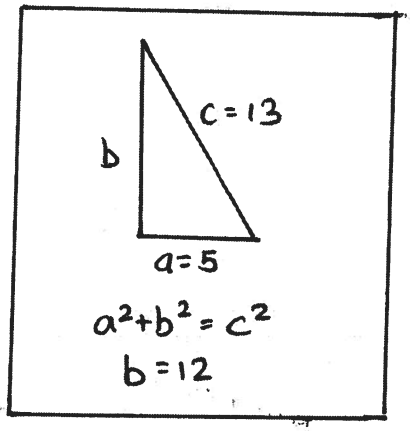


Volume of bottom = (Area of Base) × Height
$= (\pi \times 5^2) \times 2$
$= 157.08\ cm^3$

Vol of cone = $\frac{(\text{Area of Base}) \times \text{Height}}{3}$
$= \frac{(\pi \times 5^2) \times 12}{3}$
$= 314.16\ cm^3$

Total Vol = $471.24\ cm^3$

$\frac{471.24 cm^3}{1} \times \frac{1\,in}{2.54cm} \times \frac{1\,in}{2.54cm} \times \frac{1\,in}{2.54cm} = \boxed{28.76\,in^3}$



$a^2 + b^2 = c^2$

$b = 12$

Area of side of cone = πrs
$= (3.14)(5)(13)$
$= 204.20\ cm^2$

Area of side of cylinder = $2\pi rh$
$= (2)(3.14)(5)(2)$
$= 62.83\ cm^2$

Area of bottom of cylinder = πr^2
$= (3.14)(5^2)$
$= 78.54 cm^2$

Total Area = $345.58\ cm^2$

$\frac{345.58 cm^2}{1} \times \frac{1\,in}{2.54cm} \times \frac{1\,in}{2.54cm} = \boxed{53.56\,in^2}$

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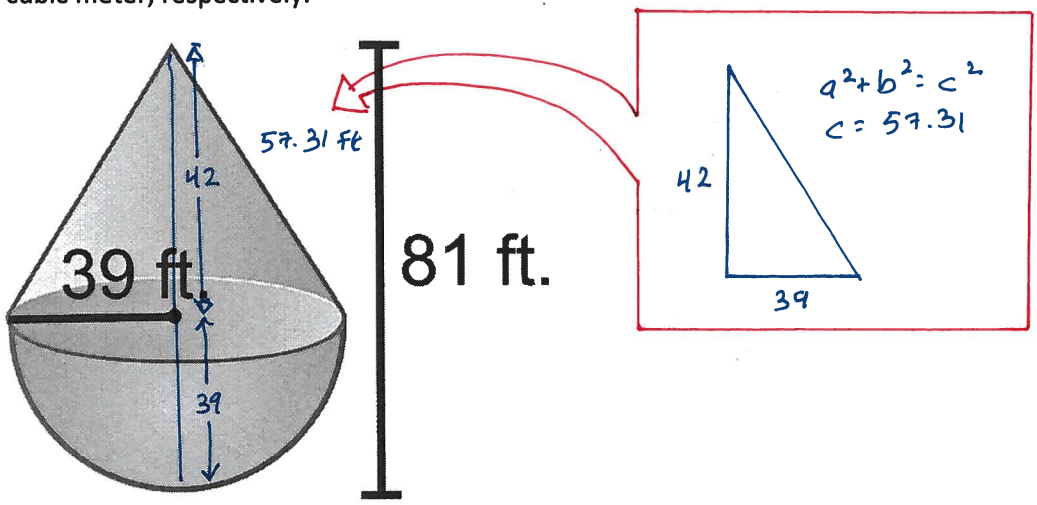
Q8: Calculate the surface area and volume of the composite shape to the nearest square meter and cubic meter, respectively.



Vol of Cone $= \frac{(\text{Area of base}) \times \text{Height}}{3} = \frac{(\pi r^2) \times h}{3} = \frac{(3.14)(39)^2 \times (42)}{3}$

$= 66,897.07\ ft^3$

Vol of Half Sphere $= \frac{1}{2}\left(\frac{4}{3}\pi r^3\right) = \frac{1}{2}(248,474.85) = 124,237.42\ ft^3$

Total Vol $= 191,134.50\ ft^3$

$$\frac{191,134.50\ ft^3}{1} \times \frac{30.48cm}{1\ ft} \times \frac{30.48cm}{1\ ft} \times \frac{30.48cm}{1\ ft} \times \frac{1m}{100cm} \times \frac{1m}{100cm} \times \frac{1m}{100cm} = \boxed{5412.3\ m^3}$$

Area of Pointy Cone Part $= \pi rs = (3.14)(39)(57.31) = 7021.74\ ft^2$

Area of Half Sphere $= \frac{1}{2}(4\pi r^2) = \frac{1}{2}(19,113.45) = 9556.72\ ft^2$

Total Area $= 16,578.47\ ft^2$

$$\frac{16,578.47\ ft^2}{1} \times \frac{30.48cm}{1\ ft} \times \frac{30.48cm}{1\ ft} \times \frac{1m}{100cm} \times \frac{1m}{100cm} = 1540.19\ m^2$$