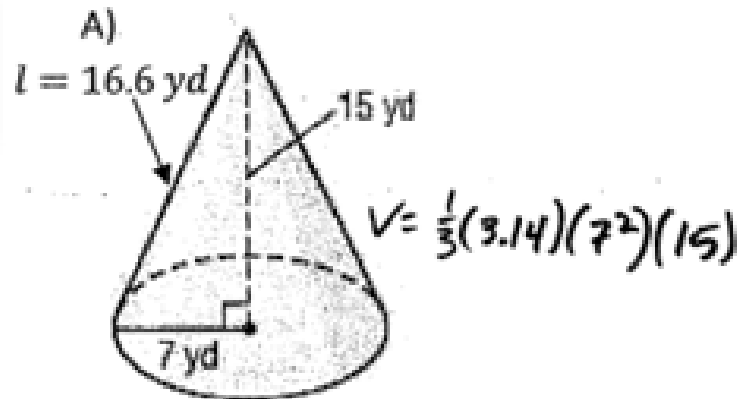Welcome back! Check your optional test review if you did it over break. Test on Thursday!

Classwork - Volume and Surface Area of Composite Solids

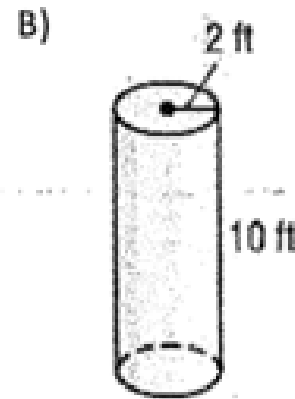1) Find the volume and surface area of the following 3D figures. SHOW WORK AND LABEL.

A)

$l = 16.6$ yd

15 yd

7 yd

$V = \frac{1}{3}(3.14)(7^2)(15)$

$V = \underline{769.3\,yd^3}$

L.A. $= 3.14(7)(16.6) = 364.87\,yd^2$

A $fo(8) = 153.86\,yd^2$

SA $= 364.87 + 153.86 = 518.73\,yd^2$

S.A. $= \underline{518.73\,yd^2}$

B)

2 ft

10 ft

$V = 3.14(2^2)(10)$

$V = \underline{125.6\,ft^3}$

$C = 3.14(2)(2) = 12.56\,ft$

L.A. $= 12.56(10) = 125.6\,ft^2$

A.fo $= 3.14(2^2) = 12.56\,ft^2$

SA $= 125.6 + 12.56 + 12.56 = 150.72$

S.A. $= \underline{150.72\,ft^2}$

C)

13.4 in.

12 in.

12 in.

12 in.

$B = 12(12) = 144 \text{ in}^2$

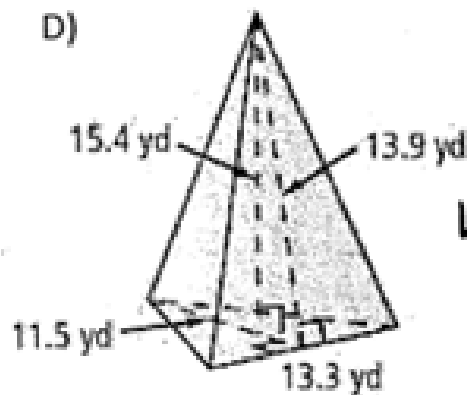$V = \frac{1}{3}(144)(12)$

$V = \underline{576 \text{ in}^3}$

$P = 12(4) = 48 \text{ in}$

$L.A. = \frac{1}{2}(48)(13.4) = 321.6 \text{ in}^2$

$B = 144 \text{ in}^2$

$S.A. = 321.6 + 144 = 465.6 \text{ in}^2$

S.A. = $\underline{465.6 \text{ in}^2}$

D)

15.4 yd

13.9 yd

11.5 yd

13.3 yd

$B = \frac{1}{2}(13.3)(11.5) = 76.48 \text{ yd}^2$

$V = \frac{1}{3}(76.48)(15.4)$

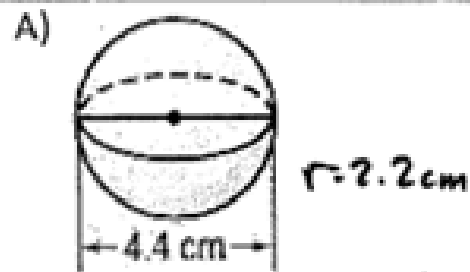$V = \underline{392.6 \text{ yd}^3}$

$P = 13.3(3) = 39.9 \text{ yd}$

$L.A. = \frac{1}{2}(39.9)(13.9) = 277.31 \text{ yd}^2$

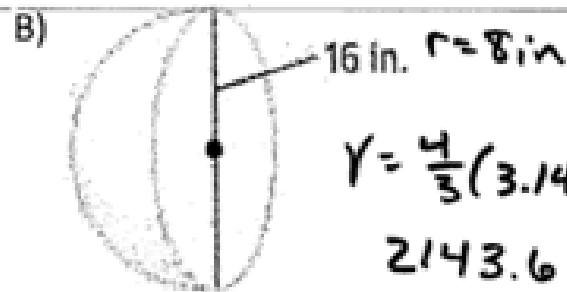$B = 76.48 \text{ yd}^2$

$S.A. = 277.31 + 76.48 = 353.79 \text{ yd}^2$

S.A. = $\underline{353.79 \text{ yd}^2}$

2) Find the volume of the sphere and hemisphere below.

A)

$r = 2.2$ cm

←4.4 cm→

$V = \frac{4}{3}(3.14)(2.2^3)$

$V = \underline{44.58 cm^3}$

B)

16 in. $r = 8$ in
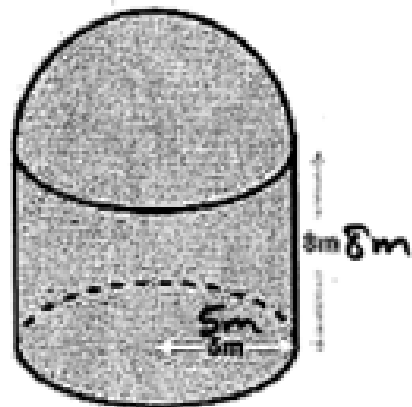
$V = \frac{4}{3}(3.14)(8^3) = 2143.57\overline{3}$

$2143.6 \div 2 = 1071.8 in^3$

$V = \underline{1071.8 in^3}$

3) Find the volume of the composite solid below. SHOW WORK AND LABEL.

8m 8m

5m
5m

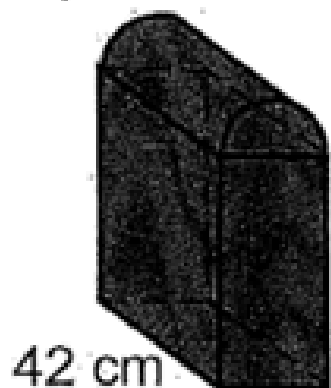V of Cylinder

$V = 3.14(5^2)(8) = 628 m^3$

V of Hemisphere

$V = \frac{4}{3}(3.14)(5)^3 = 523.\overline{3} m^3$

$523.\overline{3} \div 2 = 261.\overline{6} m^3$

$V = 628 + 261.\overline{6} = 889.\overline{6}$

$V = \underline{889.\overline{6} m^3}$

4) Find the surface area and volume of the composite solid below. SHOW WORK AND LABEL.

S.A. of Prism

$S.A. = 9(42) + 2(42)(35) + 2(9)(35)$

$378 + 2940 + 630$

35 cm $SA = \underline{3948 cm^2}$

42 cm

9 cm

S.A. of ½ cylinder
$C = 3.14(9) = 28.26$
$L.A. = 28.26(42) = 1186.92$
$1186.92 \div 2 = \underline{593.46 in^2}$

A of ½ O (Both)
$A = 3.14(4.5^2) = \underline{63.59 cm^2}$

V of Prism
$V = 42(9 \times 35) = 13230 cm^2$

V of ½ Cylinder
$V = 3.14(4.5^2)(42) = 2670.57 cm^3$
$2670.57 \div 2 = 1335.29 cm^3$
$V = 13230 + 1335.29$

$S.A. = \underline{4605.05 cm^2}$ $V = \underline{14565.29 cm^3}$

$S.A. = 3948 + 593.46 + 63.59$

5) Find the height of a square pyramid with the volume of 96 cubic feet and base with 6 feet sides.

$V = \frac{1}{3} Bh$

$B = 6(6) = 36$

$96 = \frac{1}{3}(36) \cdot h$

$\frac{96}{12} = \frac{12h}{12}$

$\boxed{8 ft = h}$

6) Pyramid A is similar to Pyramid B. Pyramid B has a volume of 972 cubic inches. By what scale factor can you multiply every side of Pyramid A to get Pyramid B if the volume of Pyramid A is 36 cubic inches? SHOW WORK
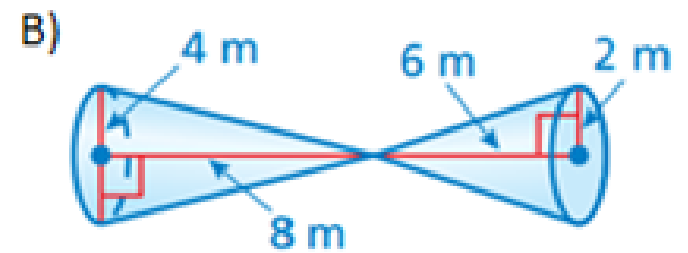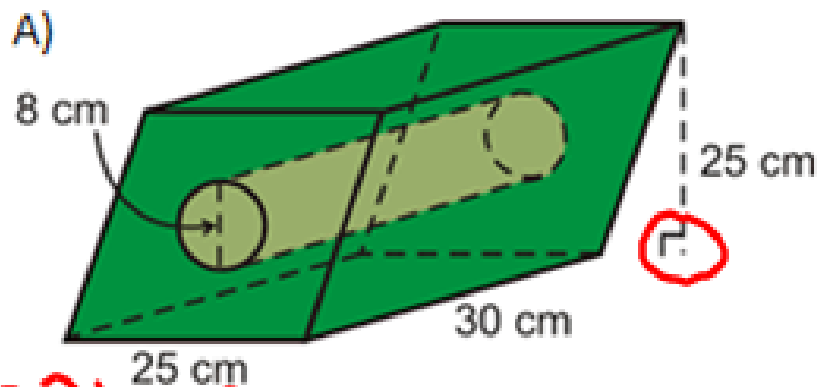
$\frac{972 in^3}{36 in^3} = 27$ times larger volume $\sqrt[3]{27} = 3$

$\boxed{Scale\ factor = 3}$

1) Find the volume of the following composite solids. SHOW WORK AND LABEL.

A)

8 cm
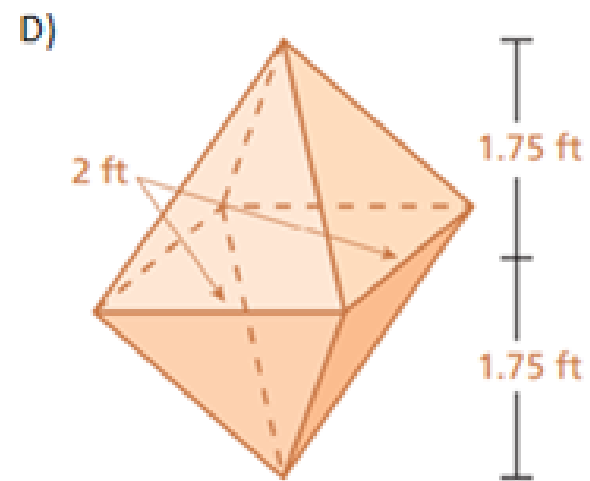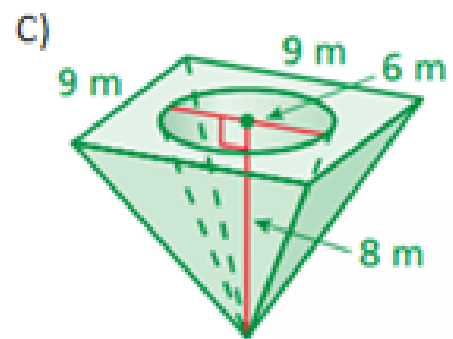
25 cm

30 cm

25 cm

r.

B)

4 m   6 m   2 m

8 m

$V = Bh$ $B = 25 \cdot 25 = 625 cm^2$

$V = 625(30) = 18750 cm^3$

$V = 3.14 \cdot r^2 \cdot h$

$V = 3.14 \cdot 4^2 \cdot 30 = 1507.2 cm^3$

Total $V = 18750 - 1507.2 = 17242.8 cm^3$

C)

9 m
9 m
6 m
8 m

D)

2 ft
1.75 ft
1.75 ft

2) Find the surface area of the following composite solids. SHOW WORK AND LABEL.

A)

7 in.

10 in.

4 in.

$C = 3.14(2)(4) = 25.12 \text{ in}$

LA of Cyl. $= 25.12(10) = 251.2 \text{ in}^2$

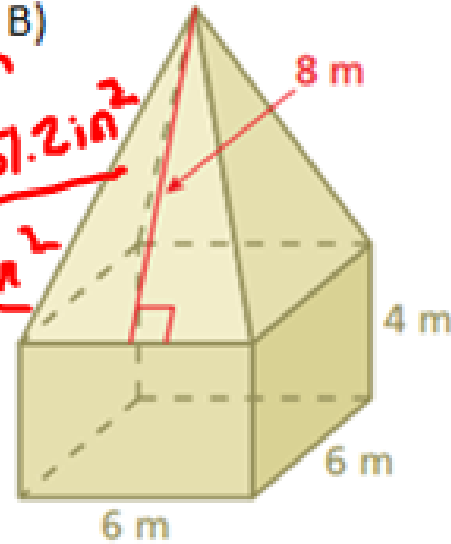$A \text{ of } \circ = 3.14(4^2) = 50.24 \text{ in}^2$

LA of Cone

$LA = 3.14(4)(7)$

$= 87.92 \text{ in}^2$

S.A. = 389.36 in^2

$SA = 251.2 + 50.24 + 87.92$
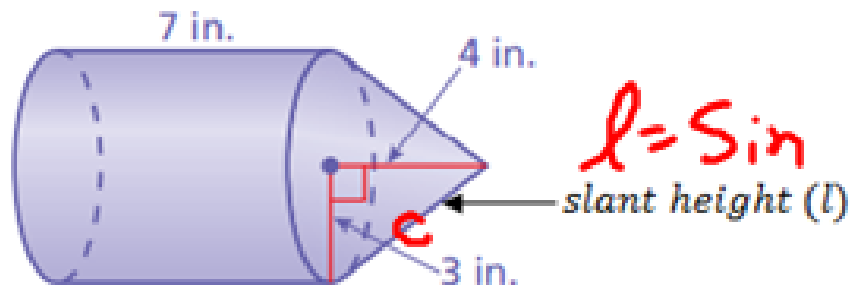
B)

8 m

4 m

6 m

6 m

S.A. = _____

3) Find the volume and surface area of the composite solid below. You will need to find the slant height of the cone to find the surface area. SHOW WORK AND LABEL.

7 in.

4 in.

$l = Sin$

slant height (l)

3 in.

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

$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$\sqrt{25} = \sqrt{c^2}$

$Sin = c$

V = _____   S.A. = _____

4) Find the volume and surface area of the greenhouse show below.. SHOW WORK AND LABEL.

Greenhouse

6ft

25ft

8 feet

25 feet

12 feet

V = _____   S.A. = _____