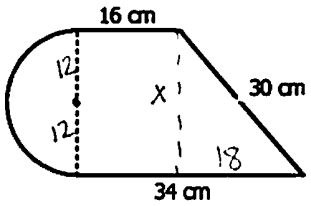
Name: Key! **Geometry Review: Packet #7**

Topic #1: Area of Composite Figures & Shaded Regions

1. Find the total area. Round to the nearest hundredth.



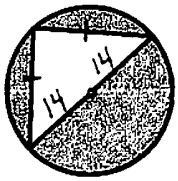
$x^2 + 18^2 = 30^2$
$x^2 + 324 = 900$
$x^2 = 576$
$x = 24$

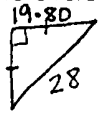
$A_{\triangle} = \frac{1}{2}\pi(12)^2$
$= 226.19$

$A_{\triangle} = \frac{1}{2}(16+34)\cdot 24$
$= 600$

Total Area $= 826.19\,cm^2$

2. If the diameter of the circle below is 28 meters, find the area of the shaded region. Round to the nearest hundredth.





$\frac{28}{\sqrt{2}} = \frac{28\sqrt{2}}{2} = 14\sqrt{2} \approx 19.80$

$A_{\triangle} = \frac{1}{2}(19.8)(19.8)$
$A_{\triangle} = 196.02$

$A_{\circ} = \pi(14)^2$
$A_{\circ} = 615.75$

$= 615.75 - 196.02$
$= 419.73\,m^2$

Topic #2: Volume & Surface Area of 3D Figures

Find the volume and total surface area of each figure. Round to the hundredths when necessary.

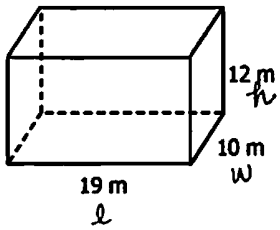
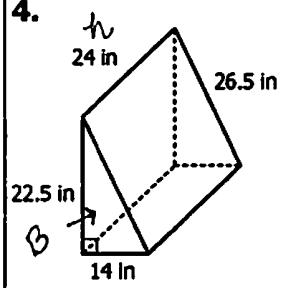
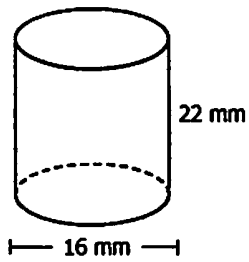
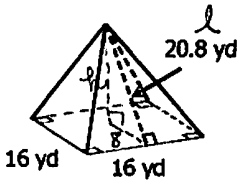
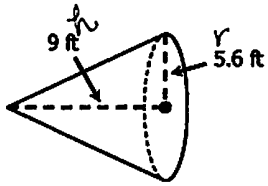
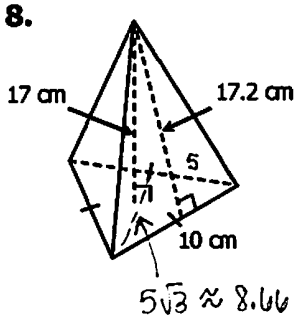
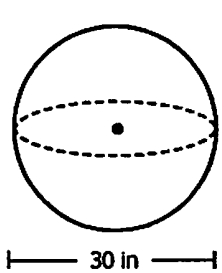
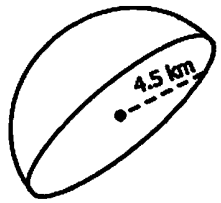
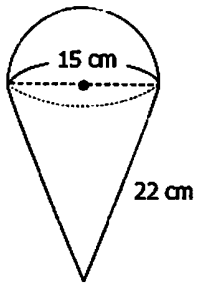
Figure	Volume	Surface Area
3. 	$V = l \cdot w \cdot h$ $V = 19 \cdot 10 \cdot 12$ $V = 2280\,m^3$	$SA = 2lw + 2lh + 2wh$ $SA = 2\cdot 19\cdot 10 + 2\cdot 19\cdot 12 + 2\cdot 10\cdot 12$ $SA = 1076\,m^2$
4. 	$V = B \cdot h$ $V = (157.5)(24)$ $V = 3780\,in^3$ $B = \frac{1}{2}(22.5)(14)$ $B = 157.5$	$SA = h \cdot p + 2B$ $SA = 24\cdot 63 + 2\cdot 157.5$ $SA = 1827\,in^2$ $p = 22.5 + 26.5 + 14$ $p = 63$ $B = 157.5$
5.  $r = 8$	$V = \pi r^2 \cdot h$ $V = \pi(8)^2 \cdot 22$ $V = 4423.36\,mm^3$	$SA = 2\pi r^2 + 2\pi r \cdot h$ $SA = 2\pi(8)^2 + 2\pi(8)22$ $SA = 1507.96\,mm^2$

Figure	Volume	Surface Area
6. 	$V=\frac{1}{3}B\cdot h$ $B=16\cdot 16$ $B=256$ $V=\frac{1}{3}(256)(19.2)$ $h^2+8^2=20.8^2$ $h^2=368.64$ $h=19.2$ $\boxed{V=1638.4\ yd^3}$	$SA=\frac{1}{2}\ell\cdot p+B$ $\ell=20.8$ $p=64$ $B=256$ $SA=\frac{1}{2}(20.8)(64)+256$ $\boxed{SA=921.6\ yd^2}$
7. 	$V=\frac{1}{3}\pi\cdot r^2\cdot h$ $V=\frac{1}{3}\pi(5.6)^2\cdot 9$ $\boxed{V=295.56\ ft^3}$	$SA=\pi r^2+\pi\cdot r\cdot \ell$ $SA=\pi(5.6)^2+\pi(5.6)(10.6)$ $\boxed{SA=285.01\ ft^2}$ $\ell^2=9^2+5.6^2$ $\ell^2=112.36$ $\ell=10.6$
8. 	$V=\frac{1}{3}B\cdot h$ $B=\frac{1}{2}(10)(8.66)$ $B=\frac{1}{2}(86.6)$ $B=43.3$ $V=\frac{1}{3}(43.3)(17)$ $\boxed{V=245.37\ cm^3}$	$SA=\frac{1}{2}\ell\cdot p+B$ $\ell=17.2$ $p=30$ $B=43.3$ $SA=\frac{1}{2}(17.2)(30)+43.3$ $\boxed{SA=301.3\ cm^2}$
9.  $r=15$	$V=\frac{4}{3}\pi\cdot r^3$ $V=\frac{4}{3}\cdot\pi(15)^3$ $\boxed{V=14137.17\ in^3}$	$SA=4\pi r^2$ $SA=4\pi(15)^2$ $\boxed{SA=2827.43\ in^2}$
10. 	$V=\frac{\frac{4}{3}\cdot\pi\cdot r^3}{2}$ $V=\frac{\frac{4}{3}\cdot\pi(4.5)^3}{2}$ $\boxed{V=190.85\ km^3}$	$SA=3\pi r^2$ $SA=3\pi(4.5)^2$ $\boxed{SA=190.85\ km^2}$

Topic #3: Composite Figures & Applications

11. Find the total surface area.



Semi-sphere: $SA = 3\pi r^2 - \pi r^2$ (not including the base)

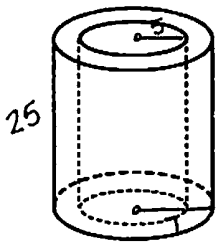
Cone: $SA = \pi r^2 + \pi r l - \pi r^2$ (not including the base)

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

$SA = 2\pi(7.5)^2 + \pi(7.5)22$

$\boxed{SA = 871.79\ cm^2}$

12. A cylindrial hole is cut through the cylinder below. The larger cylinder has a diameter of 14 mm and a height of 25 mm. If the diameter of the hole is 10 mm, find the volume of the solid. $r=7$



$V_L = \pi(7)^2 \cdot 25$

$= 3848.45\ mm^3$

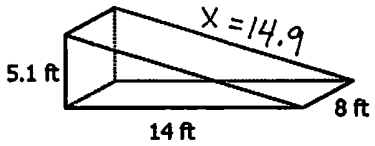
$V_S = \pi(5)^2 \cdot 25$

$= 1963.50\ mm^3$

Solid $= 3848.45 - 1963.50$

$\boxed{\text{Solid} = 1884.95\ mm^3}$

13. Cameron built a loading ramp for his moving truck. He plans to paint the ramp, excluding the base. What is the area in which he will paint?



$SA = h \cdot p + 2B - \text{Bottom}$

$SA = 8 \cdot 34 + 2(35.7) - 14 \cdot 8$

$\boxed{SA = 231.4\ ft^2}$

$5.1^2 + 14^2 = x^2$

$222.01 = x^2$

$14.9 = x$

$p = 5.1 + 14 + 14.9$

$p = 34$

$B = \frac{1}{2}(14)5.1$

$B = 35.7$

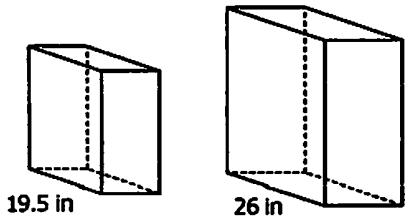
Topic #4: Similar Solids

If two solids are similar, then they have the following ratios:

Scale Factor: $a:b$ **Surface Area:** $a^2:b^2$ **Volume:** $a^3:b^3$

(where *a* and *b* represent linear measurements)

14. The prisms below are similar. Find the scale factor, surface area ratio, and volume ratio of the smaller prism to the larger prism.



Scale Factor: 3 : 4

Surface Area Ratio: 9 : 16

Volume Ratio: 27 : 64

15. Pyramid A has a volume of 60 mm³ and Pyramid B has a volume of 937.5 mm³. What is the ratio of their heights?

$\frac{60}{937.5} = \frac{8}{125}$ ← $2^3=8$ ← $5^3=125$

$\boxed{2:5}$

16. Cone A has a surface area of 384 ft² and Cone B has a surface area of 96 ft². What is the ratio of their volume?

$\frac{384}{96} = \frac{4}{1}$ ← 2^2 ← 12

$\boxed{8:1}$

17. Cylinder A is similar to Cylinder B with a scale factor of 3:7. If the surface area of Cylinder A is 153 cm², find the surface area of Cylinder B.

$\frac{9}{49} = \frac{153}{x}$

$9x = 7497$

$\boxed{x=833}$

18. Prism A is similar to Prism B with a scale factor of 6:5. If the volume of Prism B is 875 m³, find the volume of Prism A.

$\frac{216}{125} = \frac{x}{875}$

$125x = 189000$

$\boxed{x = 1512}$

Topic #5: Effects of Changing Dimensions

19. The volume of a prism is 373 ft³. If the dimensions are doubled, what will be the new volume?

$373(8) = \boxed{2984}$

20. The surface area of square pyramid is 1,089 in². If the dimensions are multiplied by 1/3, what will be the new surface area?

$1089\ (1/9) = \boxed{121}$

21. How many times larger is the volume of a cone if the height is multiplied by 3?

$V = \frac{1}{3}\pi r^2 h$

ex 1: $r=4, h=2$

$V = \frac{1}{3}\pi(16)2$

$V = 33.5$

ex 2: $r=4, h=6$

$V = \frac{1}{3}\pi(16)6$

$V = 100.5$

$\boxed{\text{3 times larger}}$

22. How many times smaller is the surface area of a sphere if the diameter is multipled by 1/4?

$SA = 4\pi r^2$

ex1: $r=12$

$SA = 4\pi(144)$

$SA = 1809.6$

ex2: $r=3$

$SA = 4\pi(9)$

$SA = 113.1$

$\boxed{\text{16 times smaller}}$