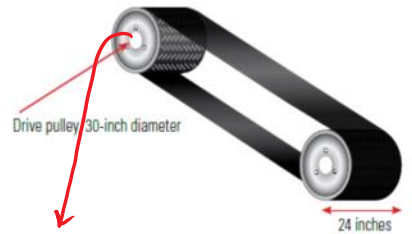


**AW Math 11**

**Day 4: Surface Area of 3-D Objects**

**Example 1:**

Conveyor-belt drive pulleys (the cylindrical drums that drive a conveyor) have a rubber coating, called lagging, on their lateral surface to help stop the belt from slipping. The conveyor belt shown has a width of 24 inches. The drive pulley has a 30-inch diameter.



What is the area of rubber coating, expressed in square inches, that is needed to cover the lateral surface of the drive pulley?



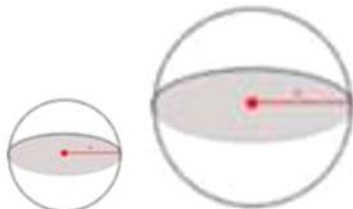
1.  ~~$SA = 2\pi r^2 + 2\pi rh$~~   
 2.  $SA = 2\pi rh$  (lateral)  
 $= 2 \times \pi \times 15 \times 24$   
 $= 2261.9 \text{ in}^2$

Can we convert to feet?  $144 \text{ in}^2$   
 So...  $2261.9 \div 144 = 15.7 \text{ ft}^2$

~~Example 2:~~

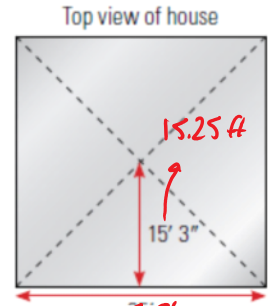
Using  $r$  to represent the radius of a small sphere, how many times greater is the surface area of the large sphere?

Let the small sphere have radius  $r$ .  
 Let the large sphere have radius  $3r$ .



**Example 3:**

Alexis is estimating the cost to re-shingle her roof. To determine the number of shingles, she must calculate the surface area of the roof. The roof is shaped like a pyramid with each side having a base length of 25 feet and a slant height of 15 feet 3 inches.



**What is the total surface area she needs to cover?**

$$\begin{aligned}
 \text{Area } \Delta &= \frac{b \times h}{2} \\
 &= \frac{25 \times 15.25}{2} \\
 &= 190.625 \times 4 \quad \leftarrow 4 \Delta \text{ on roof} \\
 &= \boxed{762.5 \text{ ft}^2}
 \end{aligned}$$

$$\begin{aligned}
 \text{Rec } 15'3'' &= 15 \frac{3}{12} \\
 &= 15.25 \text{ ft}
 \end{aligned}$$

Some Additional Notes on Pyramids: or Cones

Slant height vs height



If height is 4, and base is 6  
what is slant height (s)

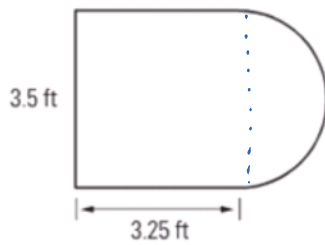


$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 4^2 + 3^2 &= 25 \\
 \sqrt{25} &= 5 \quad S=5
 \end{aligned}$$

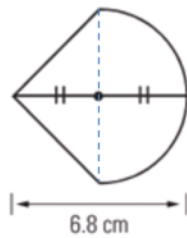
Assignment pg 20-23  $\frac{1}{2}$  1-9

**Day 4 Assignment: SA of Composite Shapes and 3-D Objects**

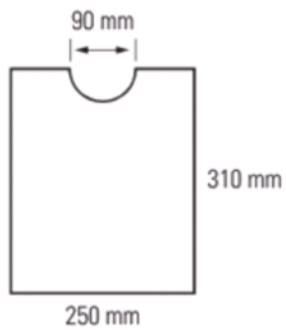
1) Calculate the area.



2) Calculate the area.



3) Calculate the area of the following figure.

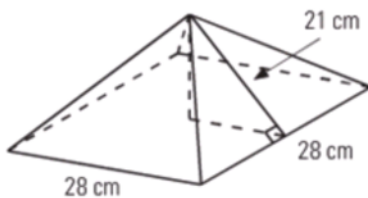


4) Draw a cylindrical tank that has a radius of 1.5 m and a height of 5 m, and find its SA.

5) What is the SA of a pipe (assume hollow, or it would be a 'rod') with a diameter of 4.5 cm and length of 18.8 cm?



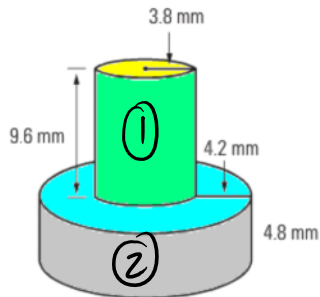
6) Find the surface area of the square-based pyramid below.



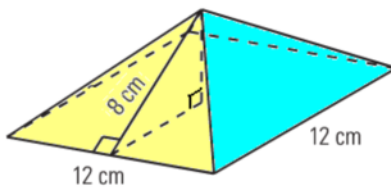
7) What is the SA of the metal part below? Note that:

- The upper cylinder is centred on the lower one
- Include the base

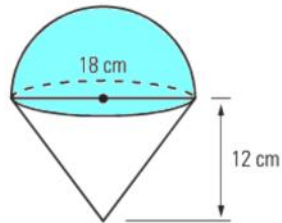
\* SUB. 2 CIRC AREAS  
 ↳ OVERLAP



8) Find the total surface area of a square pyramid with a base of 12 cm by 12 cm, and a slant height of 8 cm.

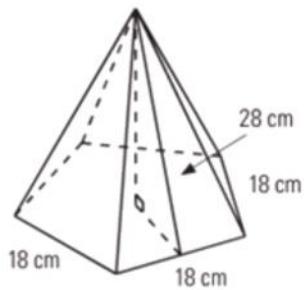


9) Find the surface area of the cone topped by the hemisphere.



ENRICHED / BONUS

10) A pentagonal-based pyramid is sitting on a table. If the sides of the pentagon are 18 cm, and the slant height of the triangles is 28 cm, what is the exposed area of the pyramid?



## AW Math 11

- 11) Daniel fabricates a section of furnace duct out of sheet metal. The duct is open at the upper left face and bottom lower face (so air can travel through).

**What is the total area of sheet metal needed?**

