**Lesson 4 – Surface Area Problems**

**Goal: Solve problems involving surface area calculations using Imperial & SI measurements**

Example 1:

The lengths of the sides of regular tetrahedron and slant height are given. What is the surface area of the tetrahedron?



\*\*\* Note a regular tetrahedron is a triangular pyramid with all 4 sides being triangles of the same size\*\*\*\*

Surface Area = 4 x ( Area of the triangular Side)

 = 4 x ( $\frac{b x slant}{2}$ )

 = 4 x ($\frac{9 x 7.8}{2}$)

 = 4 x 140.4 cm2 ( Don’t forget units!)

Example 2:

A right cone has a base radius of 2ft and a height of 7ft. Calculate the surface area of the cone to the nearest square foot.



Surface Area of a cone = πr2 + πrs

The slant has to be found before the surface area can be calculated.

Use Pythagorean theorem for this

 S2 = a2 + b2

 S2 = 22 + 72

 S2 = 4 + 49

 S2 = 53

S = √ 53

S = 7.3 ft

Surface Area = πr2 + πrs

Surface Area = π(2)2 + π(2)(7.3)

 =12.56 + 45.84

 =58.4

The surface area of the cone is approximately 58 ft2.

Example 3:

The Great Pyramid of Giza has a square base with a side length of 755ft and an original height of 481 ft. What is the surface area of the great Pyramid.

Diagram:



 Height 481 ft

 755 ft

We only need the **lateral surface area.** The pyramid is attached to the ground so the bottom is not include in the surface area calculations.

Surface Area = 4 x area of the triangular sides

 = 4 x ($\frac{b x slant}{2}$ )

Use Pythagorean theorem to find the slant

S2 = 4812 + 377.52 ( half the side length to find slant)

S2 = 231361 + 142506.25

S2 = 373867.5

S =√ 373867.5

S = 611.44

Surface Area = 4 x ($\frac{b x slant}{2}$ )

 = 4 x ($\frac{755 x 611.44}{2}$)

 = 923274 ft2

The Great Pyramid of Giza had a surface area of 923274 ft2.