Name: _____

Class: _____ Date: _____

Fun with Math

An extension of "Moving the giants"

Great advances in technology are often facilitated by thinking creatively and out of the box. **"Moving the giants"** (page 20-21, *What's Up* May 2018) tells the exciting stories of how such thinking has helped solve big transportation challenges.

Instructions

a. Work in pairs to answer the following questions.
b. The use of scientific calculators is allowed.
c. Calculate the following, assuming that the actual thickness of the rod does not significantly affect the calculations. Take $\prod = 22/7$

1. Find the smallest integer 'n' for which the length of the longest rod that can be placed in each of the containers below is at most ***n*** *cm* in length.

   i. A cuboid having dimensions 12cm x 9cm x 8cm.

   ii. A spherical container having total surface area of 2464cm^2.

   iii. A cone whose volume is 8800 cm^3 and height is 21cm.

   iv. A cylinder with radius 4.5cm and height 40cm.

   Hint: Surface area of a sphere = $4\prod r^2$, where r is radius of the sphere.

   Volume of a cone = $(1/3) \prod r^2h$, where r is radius of the base, and h the is height of the cone.

Optional question to get you to think out of the box.

There is no unique answer.

2. At a shipyard, there is a rectangular container (cuboid) that is 12ft x 9ft x 8ft.

   i. Using part 1.i., determine if a 20 ft long pole can be enclosed in this container.

   ii. If not, suggest modifications that can be made to the shape of the container to accommodate the pole.

Hint: Think out of the box like the engineers who redesigned the Airbus A330 into the Beluga XL. Assume the shipyard can arrange for the necessary tools and materials to make the modifications suggested.