Polyhedra
10 points-- Why can't we make a Platonic solid with hexagonal faces?

20 points-- Draw a right triangular pyramid.

30 points-- List the Platonic Solids.

40 points-- A prism has 96 edges. How many vertices and faces does it have?
Surface Area
10 points-- Find the surface area of the following solid.

20 points-- Find the surface area of a sphere with radius of 5 meters.

30 points-- Find the surface area of a right circular cone with radius of 2 ft. and height of 6 ft.
Surface Area (continued)
40 points-- Find the surface area of the following shell.

![Diagram of a cylindrical shell]

16 cm

20 cm

15 cm

50 points-- Find the surface area of the following solid.

![Diagram of a solid with dimensions 4 ft, 10 ft, and 3 ft]
Volume
10 points-- Find the volume of the following solid.

20 points-- Find the volume of a sphere with radius of 5 meters.

30 points-- Find the volume of a right circular cone with radius of 2 ft. and height of 6 ft.
Volume (continued)
40 points--Find the volume of the following shell.

50 points--Find the volume of the following solid.
Scaling
10 points-- If a cube's sides double in length, what happens to its surface area?

20 points-- If a cube's sides triple in length, what happens to its volume?

30 points-- We have a scale model prism whose height is 5 inches, and we want the actual prism to have a height of 10 feet. What is the relationship between the scale model's surface area and the actual surface area?
Scaling (continued)
40 points-- We have a scale model prism whose height is 5 inches, and we want the actual prism to have a height of 10 feet. What is the relationship between the scale model's volume and the actual volume?

50 points-- For a right square pyramid with height $h = 8$ inches and the base side length $= 5$ inches, what is the surface area and volume? If we scale that up to have a height of 3 ft, what is its surface area and volume?
Hodge Podge

10 points-- Give an exact definition of a sphere.

20 points-- What is Euler's Formula and what does it apply to?

30 points-- Find the area of a regular hexagon whose sides are 4 cm in length.
Hodge Podge (continued)
40 points-- What is the relationship between h, l and e (as drawn on this pyramid)?

50 points-- State the Pythagorean Theorem and give a proof.