Geometry Homework #6

1) For a regular heptagon, find, exactly, its radius, its area, and the areas of the inscribed and circumscribed circles if its apothem is 3 and the length of one of its sides is 8.
2) For a regular triangle, find, exactly, its radius, the length of one of its sides, its area, and the areas of the inscribed and circumscribed circles if the length of its apothem is 7.
3) For a regular pentagon, find, exactly, its apothem, its area, and the areas of the inscribed and circumscribed circles if its radius is 16 and the length of one of its sides is 20.
4) Find the sum of the interior angles, the sum of the exterior angles, the size of one interior angle, and the size of one exterior angle in a regular nonagon.
5) For a regular quadrilateral, find, exactly, its radius, the length of one of its sides, its area, and the areas of the inscribed and circumscribed circles if the diameter of the circumscribed circle is $6\sqrt{2}$.
6) Find (exactly AND approximately) the surface area and volume for a right cylinder with a radius of 6 and a height of 10.
7) Find (exactly AND approximately) the surface area and volume for a right cone with a radius of 20 and a height of 21.
8) Find (exactly AND approximately) the surface area and volume for a sphere with a radius of 7.
9) Find (exactly AND approximately) the surface area and volume for a right cylinder with a diameter of 16 and a height of 5.
10) Find (exactly AND approximately) the surface area and volume for a right cone with a diameter of 10 and a slant height of 13.
11) Find (exactly AND approximately) the surface area and volume for a sphere with a diameter of 18.
12) Find (exactly AND approximately) the surface area and volume for a right cylinder with a radius of 4 and a height of 13.
13) Find (exactly AND approximately) the surface area and volume for a right cone with a diameter of 14 and a height of 24.
14) Find (exactly AND approximately) the surface area and volume for a sphere with a radius of 12.
15) Find (exactly AND approximately) the surface area and volume for a right cylinder with a diameter of 8 and a height of 3.

16) Find (exactly AND approximately) the surface area and volume for a right cone with a radius of 15 and a slant height of 17.

17) Find (exactly AND approximately) the surface area and volume for a sphere with a diameter of 4.

18) Find (exactly AND approximately) the surface area and volume for a right cylinder with a radius of 16 and a height of 4.

19) Find (exactly AND approximately) the surface area and volume for a right cone with a diameter of 8 and a height of 3.

20) Find the exact volume for a sphere with a radius of 6. Find the exact volume for a right cylinder with the same radius and a height of 12. Find the exact volume of a right cone with the same radius and a height of 6. What is the relationship between the volumes of all three shapes and what is the relationship between the volumes of the sphere and the cylinder?