MATH 310 ♦ Sample Test on Measure ♦

Show all work.

(10) 1a. A regular icosahedron has a 60 mL capacity. If a new regular icosahedron is constructed with every edge twice as long as the original, what is the capacity of the new icosahedron?

1b. If the edge of a cube is increased by 2 cm, what is the effect on the surface area of the cube? If the edge of a cube is increased by 20%, what is the effect on the surface area of the cube? (One of these questions is answerable, the other is not)

(12) 2. Convert each of the following, showing your work.
   a. \(5.2 \text{ hm} = \) ____ dm    b. \(53 \times 10^6 \text{ cm}^3 = \) ____ \(m^3\)   c. 500 ml water (at 4°C) = ____ kg.

(8) 3. How many liters of water are needed to fill a tank that is 1 meter wide, half a meter high and half a meter deep? Show the dimensional analysis that leads to your answer.

(12) 4. Find the volume of the prism shown below right. (The small squares indicate right angles.)

(5) 5. The base of a cone is a 160 cm\(^2\) region enclosed by a simple closed curve. The base has perimeter 60 cm. The height of the cone is 40 cm. Find the volume of the cone.

(12) 6. Find the surface area of the solid illustrated above left. Assume all angles between connected segments are right angles.

(8) 7. Estimate the area of the figure in #7.

(5) 8. Find the area enclosed by the figure in #8.

(6) 9. Find the distance between the points \((-3,4)\) and \((5,-2)\).

(7) 10. Find the perimeter of the figure at right. Given all arcs are semicircular.

(7) 11. Find the area of a 30° sector of a circle with radius 40 cm.

(6) 12. Which of the following is the Volume of a sphere?

   Which of the following is the Surface Area of a sphere?

   \[2\pi r, \quad \pi r^2, \quad 2\pi r^2, \quad \frac{4\pi r^2}{3}, \quad 4\pi r^2, \quad \frac{4\pi r^3}{3}, \quad 2\pi r^3, \quad 4\pi r^3\]

(8) 13. Find the area of the shaded region within the circle.