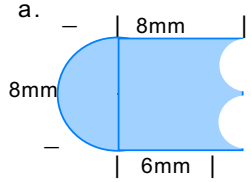
MATH 310 ✔ Self-Test MEASURE ✔

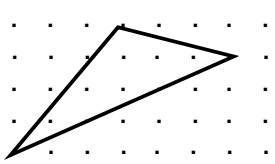
1. Find the *exact* perimeters of, and areas inside of, figures a and b.

a.

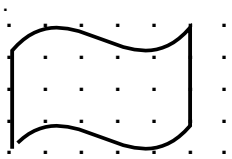


←*Assume arcs are semi-circular*

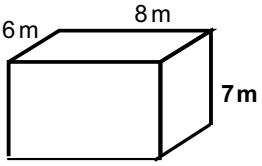
b.



c.



d.



1c. Estimate the area inside the curve shown above right (at 1c), using the "whole & half squares" procedure.

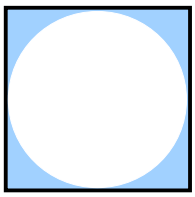
1d. Refer to box. If each dimension is doubled, are the volume & surface area doubled? Explain. If each dimension is increased by 1m, is the volume increased by $1m^3$? Explain.

2. *Demonstrate* with an appropriate sketch that the area of a parallelogram is the same as that of a rectangle of equivalent height and width.

3. Without having to look up any formulas, (a-c) find the area enclosed by a:
a. trapezoid of height *h* with bases *a* and *b*. b. circle of radius *r* c. x° sector of a circle of radius *r*
& find: d. circumference of a circle of radius *r* e. volume and f. surface area of a sphere of radius *r*

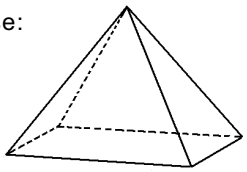
4. a. Sketch the points (-4,5) and (4,1) in the plane. Find the distance between the points.
b. Do the points (-1,4), (2,0), and (-2,-3) lie at the vertices of a right triangle? How do you know?

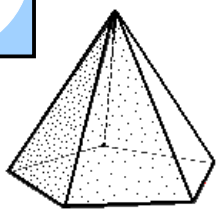
5. Find the area inside a square of side 12 cm. but outside of the inscribed circle.



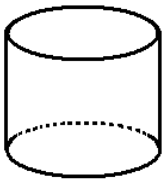
6. Find the volume of a prism 20 meters high, given the *octagonal base* has area 400 square meters.

7. Find the volume of a pyramid with height 20 cm. & base:
a. a 30 cm. by 30 cm. square.
b. an 80 cm^2 pentagon.



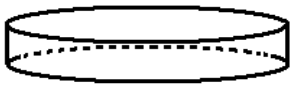


8. Find the volume and lateral surface area of
a. a cone of height 25 cm. with base radius 5 cm.
b. a circular cylinder of height 25 cm. with base radius 5 cm.



9. Find the surface area and volume of a wedge of brie cut from a wheel 3 cm. high and 30 cm in diameter, given

a. the wedge is one-sixth of the original wheel.
b. the central angle of the wedge is 30°.



10. Find the total surface area and volume of an ice cream cone, filled and topped with a hemisphere of ice cream, given these facts: the diameter of the top of the cone is 10 cm. and the height of the cone is 12 cm.

11. Using the fact that water freezes at 32°F & 0°C, & boils at 212°F & 100°C, determine a formula that relates temperatures in degrees Fahrenheit to degrees Celsius. Sketch a conversion graph, with °F on one scale, and °C on the other. Use your formula to convert each temperature to its counterpart. a. 72°F b. 30°C c. 98.6°F

12. From the list, select the *most appropriate* metric units of measurement for each item.

kg	**m**	**mm**	**cm**	**km**	**cc**	**ml**	**kl**	**L**	**t**	**g (gm)**

a. width of a finger b. length of a finger c. height of a bridge d. distance from N.Y.C. to Miami
e. mass of a book f. mass of a ring g. mass of a fly h. mass of a car
i. dropperful of medicine j. gasoline for a car k. drink of water l. water in a swimming pool

13. Convert 1 kiloliter of water to liters; (then) to milliliters; to cc's; to grams*; to kilograms; then to metric tons.

14. a. Carpet costs $32.00 a square yard; wood flooring $4 per square foot. Which costs less?
b. How many square inches comprise a square foot? How many square feet comprise a square yard?
c. How many cubic inches are in a cubic foot? ...cubic feet in a cubic yard? ...cubic inches in a cubic yard?
d. How many cc's (cm^3) in a cubic meter? How many milliliters in a cubic meter?
e. How many grams of water in a cubic meter? (at 4°C) f. 1300 mL = ____ daL
g. 300 *dam* = ___ *cm* h. 200 cm^2 = ___ m^2 i. 328 dL = ___ cm^3 j. 12.5 m^3 = ___ dm^3

15. John must wrap a new baton, 26" long, for his orchestra leader. Will the baton fit in a 24" by 7" by 7" box?

16. A photo is enlarged to 2.5 times original height & width. The area was 100 cm^2. What is the area now?