Date _____
Unit 3-10 Measurement REVIEW

1. The Great Pyramid of Giza was constructed as a regular pyramid with a square base. It was built with an approximate volume of 2,592,276 cubic meters and a height of 146.5 meters. What was the length of one side of its base, to the *nearest meter*?

$V = \frac{1}{3}(L \times W)h$

$2,592,276 = \frac{1}{3}(L \times W)(146.5)$
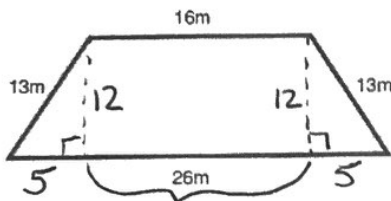
$53084.15017 = (L \times W)$

one side = 230 m

2. A designer needs to create perfectly circular necklaces. The necklaces each need to have a radius of 10 cm. What is the largest number of necklaces that can be made from 1000 cm of wire?

$C = 20\pi$

$\frac{1000}{(20\pi)} \approx 15$ necklaces

3. What is the area of the trapezoid pictured below (nearest square meter)?
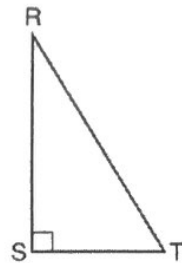
16m

13m 12   12   13m

5   26m   5

$A = \frac{1}{2}(b_1 + b_2)h$

$= \frac{1}{2}(26+16)(12)$

$= 252 \text{ m}^2$

4. Which object is formed when right triangle *RST* shown below is rotated around leg $\overline{RS}$?

Cone

R

S   T

5. A gallon of paint will cover approximately 450 square feet. An artist wants to paint all the outside surfaces of a cube measuring 12 feet on each edge. What is the *least* number of gallons of paint he must buy to paint the cube?

$6(12 \times 12) = 864$
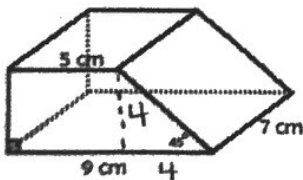
$864 \div 450 \approx 1.92$

2 gallons

6. Two prisms have equal heights and equal volumes. The base of one is a <u>hexagon</u> and the base of the other is a square. If the area of the hexagonal base is 49 square inches, how many inches are in the length of each side of the square base?

equal height + equal volume = equal base areas
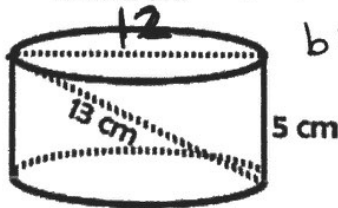
$\sqrt{49} =$ 7 in

7. Find the volume of each:

exact

5 cm

4

9 cm   4   7 cm

$V = (\frac{1}{2}(5+9)(4)) \cdot 7$

$V = 196 \text{ cm}^3$

in terms of π

12

13 cm   5 cm

$V = \pi(6)^2(5)$

$V = 180\pi$

square pyramid
nearest tenth

$5^2 + 6^2 = 13^2$

$b = 12$

$4\sqrt{3}$ 8 cm

4 $60°$ 8
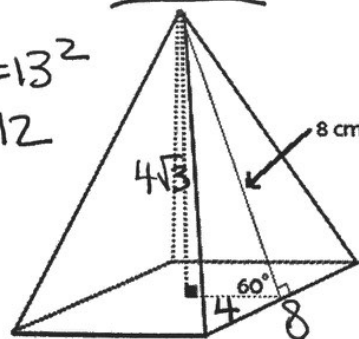
$V = \frac{1}{3}(8 \times 8)(4\sqrt{3})$

$V = 147.8 \text{ cm}^3$ exact

exact

12 cm

6   $30°$

$6\sqrt{3}$

$V = \frac{1}{3}\pi(6)^2 6\sqrt{3}$
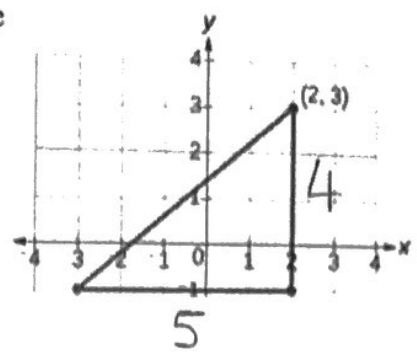
$V = 72\pi\sqrt{3}$

$15\sqrt{2}$

15   25 cm
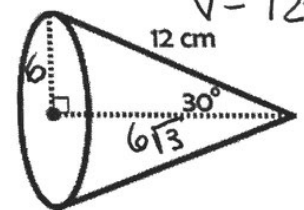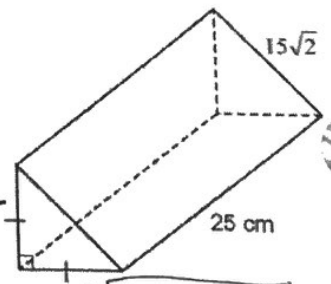
15   $V = 2812.537$

is the volume (to the nearest tenth) of the solid formed when the ...ure below is rotated continuously around the line y = -1.
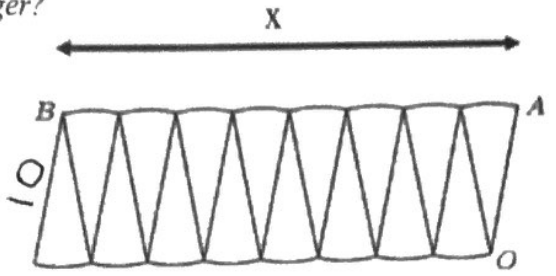
Cone

$$V = \frac{1}{3}\pi(4)^2(5)$$
$$= 83.8$$

(graph showing right triangle with vertex at (2,3), labeled 4 and 5)

9. A circle with a radius of 10 was divided into 16 congruent sectors. The sectors were then rearranged, as shown in the diagram below. What is the value of x to the *nearest integer*?

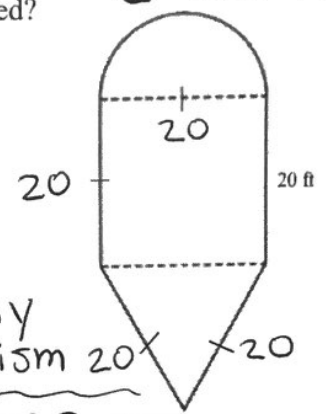$$X = \frac{1}{2} \text{ circumference}$$

$$\frac{C}{2} = \frac{20\pi}{2} = 10\pi \approx \boxed{31}$$

$$C = 20\pi \div 2 = 10\pi$$

10. How much fencing (nearest tenth) is needed to enclose the playground pictured?

$$4(20) + 10\pi \approx \boxed{111.4 \text{ ft}}$$

(diagram of playground: 20, 20, 20 ft, 20, 20, 20)

11. Name 2 types of polyhedron studied this unit. Why are they polyhedrons?
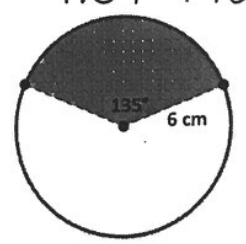
3-D solids w/ flat faces, Ex. Cube, any prism

12. Name a solid that is not a polyhedron and explain why it is not.

Cylinder, sphere, cone — Lateral faces are not flat (not polygons)

13. What is the area of the sector in terms of π?

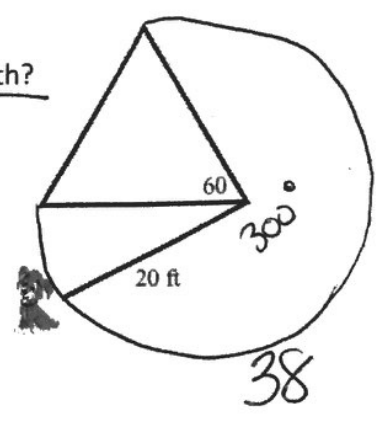$$\frac{135}{360} \cdot 36\pi = \frac{27}{2}\pi$$

(circle with 135° sector, 6 cm radius)

14. What is the total area that the dog can roam while attached to his leash to nearest tenth?

*Think of area dog can roam as a sector!

$$\frac{300}{360} \cdot (20)^2\pi = 1047.2$$

(circle diagram with 60°, 300°, 20 ft)

38

15. One quart of paint will cover 100 square feet. Matthew is trying to paint a school project which is in the shape of a cube measuring 4 feet on each side. Will one quart of paint be enough? Justify your answer.

$$\underline{\text{surface Area}}$$
$$6(4 \times 4) = 96 \text{ ft}^2$$

yes, one quart of paint will be enough b/c the surface area of the cube is 96 ft².

16. State the 2-dimensional cross section shape for each solid (parallel to base).

square   rectangle   rectangle   circle circle
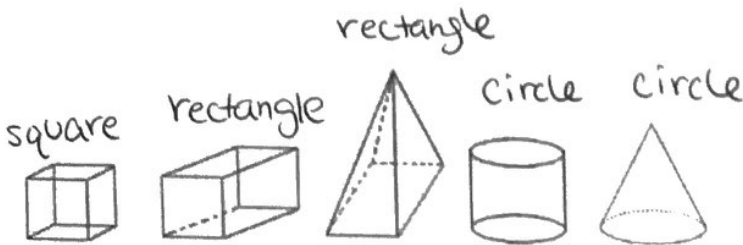
17. A right circular cylinder has a volume of 800 cubic feet and a height of 6 feet. What is the radius of the cylinder to the nearest tenth of a foot?

$$V = \pi r^2 h$$
$$\frac{800}{(6\pi)} = \frac{\pi r^2 (6)}{6\pi}$$
$$\sqrt{42.4413} = \sqrt{r^2}$$
$$6.5 = r$$

18. Michael is making pudding for a school project. He fills each rectangular cup with dimensions 2in, 3 in, 1in with 4 cubic inches of pudding. What percent of each cup is empty?

$$V = 2 \times 3 \times 1 = 6 \text{ in}^3$$
empty: $\frac{2}{6} \times 100 \approx 33\%$

19. The diameter of a softball is 3.5 inches and the diameter of a soccer ball is 8.5 inches. Approximately how many times larger is the volume of the soccer ball?
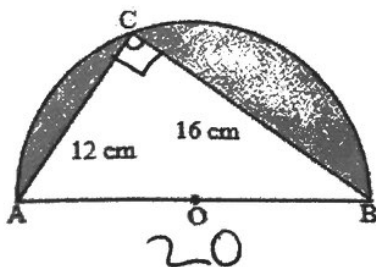
$$\frac{(4.25)^3}{(1.75)^3} \approx 14$$

Softball
$$V = \frac{4}{3}\pi(1.75)^3 \approx 22$$

$$\underline{\text{soccer ball}}$$
$$V = \frac{4}{3}\pi(4.25)^3 \approx 322$$

$$\frac{322}{22} \approx 14 \text{ times larger}$$

20. What is the area of the shaded region which consists of a right triangle inside of a semi-circle in terms of π?

C
12 cm 16 cm
A   O   B
20

$$12^2 + 16^2 = c^2$$
$$\sqrt{400} = \sqrt{c^2}$$
$$20 = c$$

$$A_{semi\text{-}circle} = \frac{1}{2}\pi(10)^2$$
$$= 50\pi$$
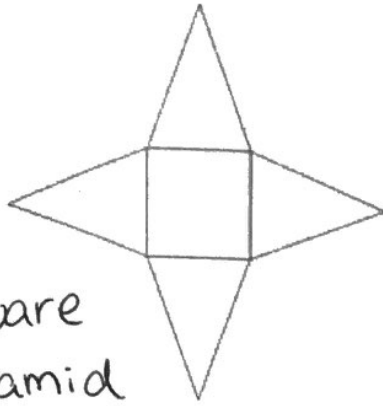
$$A_{triangle} = \frac{1}{2}(12)(16)$$
$$= 96$$

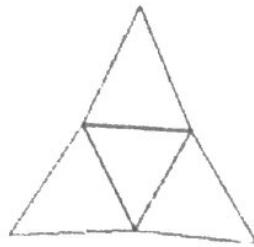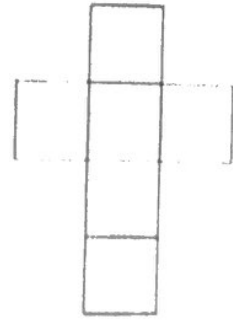$$\boxed{A_{shaded} = 50\pi - 96}$$

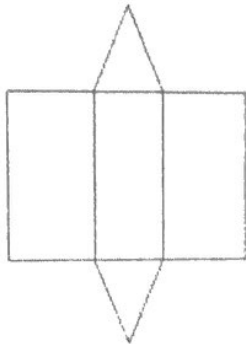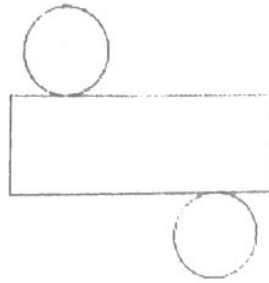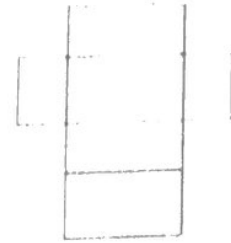39

Name each shape:

Nets!

square
pyramid

triangular
pyramid

cube

triangular
prism

Cylinder

rectangular
prism

2. kitchen was remodeled and granite counter tops were installed. A rectangular island in the kitchen now has
granite top measuring 6 ft. by 8 ft. by 1.2 inches. The density of granite is 168.6 pounds per ft³.

$$V = 6 \times 8 \times 1.2 = 57.6 \ in^3$$

a) How much does the granite top on the island weigh, to the nearest tenth of a pound?

b) The average grown man can comfortably carry 110 pounds. How many men will be needed to carry the
granite top into the kitchen for installation?

a) $*D = \dfrac{m}{V}$ $168.6 = \dfrac{m}{57.6}$

$$m = 9,711.4 \ lbs$$

b) $\dfrac{9,7114}{110} = 88.2 \approx 89 \ men$

40