Review Chapter 12 Volume

Name **Key**

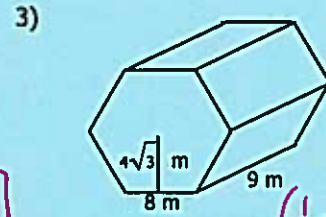Wednesday

Period _____

Find the volume of the following prisms. $V = B \cdot h$

1)

6 cm, 17 cm, 20 cm

$6 \cdot 20 \cdot 17 = \boxed{2040 \, cm^3}$

2)

12, 16, 16, 20, 10

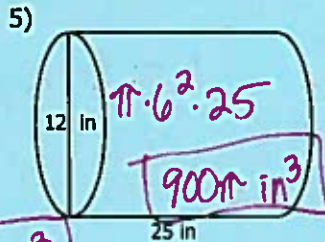$\frac{1}{2}(12)(16) \cdot (10) = \boxed{960}$

3)

$4\sqrt{3}$ m, 8 m, 9 m
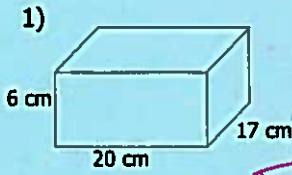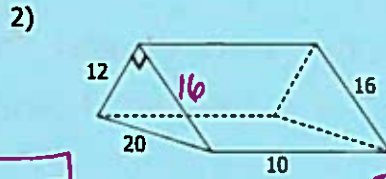
$\left(\frac{1}{2} \cdot 4\sqrt{3} \cdot 48\right)(9)$

$= \boxed{864\sqrt{3} \, m^3}$

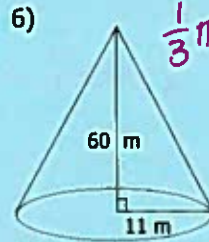Find the volume of the following cylinders and cones. Leave answer in terms of π.

$V = \pi r^2 h$

4)

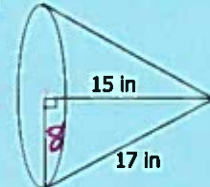13 m, 15.3 m

$\pi \cdot 13^2 \cdot 15.3$

$\boxed{2585.7\pi \, m^3}$

5)

12 in, 25 in

$\pi \cdot 6^2 \cdot 25$

$\boxed{900\pi \, in^3}$

6) $\frac{1}{3}\pi r^2 h$

60 m, 11 m

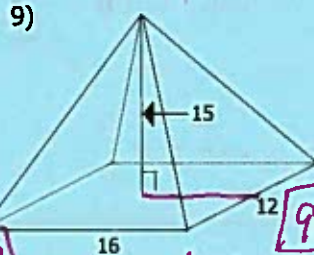$\frac{1}{3} \cdot \pi \cdot 11^2 \cdot 60$

$\boxed{2420\pi \, m^3}$

7)

15 in, 8, 17 in
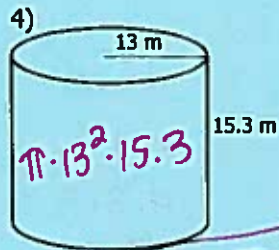
$\frac{1}{3} \cdot \pi \cdot 8^2 \cdot 15$

$\boxed{320\pi \, in^3}$

Find the volume of the following pyramids.

$\frac{1}{3}Bh$

8)

13 ft, 5, 10 ft, 10 ft

$\frac{1}{3} \cdot 10^2 \cdot 12 = \boxed{400 \, ft^3}$

9)

15, 16, 12 $\boxed{960}$

$\frac{1}{3} \cdot (16 \cdot 12) \cdot 15$

10)

8 ft, $6\sqrt{2}$ ft, $6\sqrt{2}$ ft
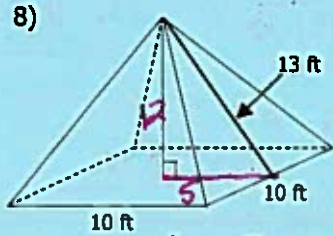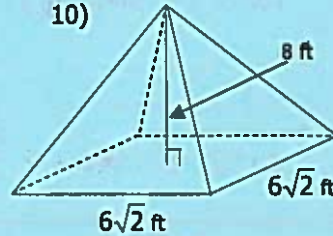
$\frac{1}{3}(72)(8) = \boxed{192 \, ft^3}$

Find the volume of the following solids.

11)

9, 7 in, 7 in, 5, 12 in, 4, 7, 9 in, 18 in

$7 \cdot 9 \cdot 5$

$12 \cdot 11 \cdot 9$

$1188 + 315$

$\boxed{1503 \, in^3}$

12)

20 cm, 5 cm, 12 cm
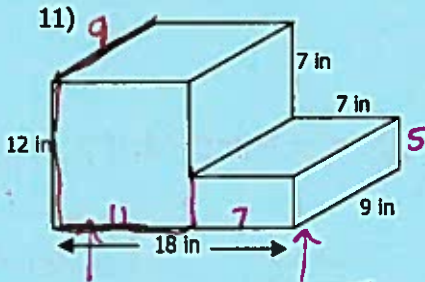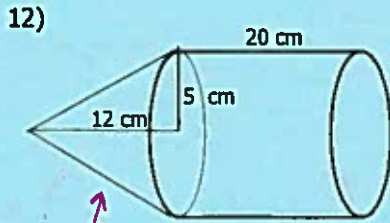
$\frac{1}{3}(5^2 \pi)(12) + 25\pi \cdot 20$

$100\pi + 500\pi$

$\boxed{600\pi \, cm^3}$

(1884)

13)

13 m, 5, 12, 24 m, 24 m, 24 m
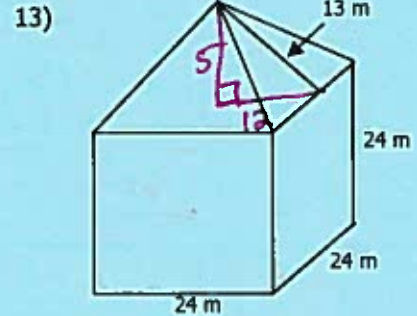
$(24)^3 + \frac{1}{3}(24^2) \cdot \frac{5}{3}$

$13824 + 960$

$\boxed{14784 \, m^3}$

$$V = \frac{4}{3}\pi r^3 \qquad SA = 4\pi r^2$$

14) Find the volume and surface area of a sphere with a radius of 9 in.

$$V = \frac{4}{3}\pi \cdot 9^3 = \boxed{972\pi \approx 3054 \text{ in}^3} \qquad SA = 4\pi \cdot 9^2 = \boxed{324\pi \approx 1017.9}$$

15) Explain the difference between the surface area of a sphere and the volume of a sphere. Give a real life example of each.

SA = covering (leather covering)
V = filling (amount of air to fill)

16) Mr. Bill took a 96 inch piece of wire and cut it into equal length, which were soldered at the ends to form the edges of a cube. What is the volume of that cube?

edges = 12 $\qquad \frac{96}{12} = 8 \qquad 8^3 = \boxed{512 \text{ in}^3}$

17) Mrs. Claus is taking a art class. Her art project is to make an cone vase. If the vase has a volume of 157 inches cubed, and a diameter of 10 inches. What is the height to the nearest inch?

$$\frac{1}{3}\pi r^2 h \qquad 3 \cdot \frac{1}{3}(25\pi)h = 157 \qquad \boxed{h \approx 6 \text{ in}}$$

18) A crate 8 feet long, 6 feet wide, and 8 feet tall is used to ship boxes of office chairs. If the box for the office chair is 4 feet long, 3 feet wide, and 2 feet tall, then how many can be shipped in each crate?
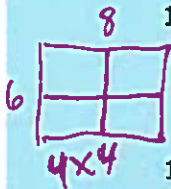
$\boxed{16 \text{ boxes}}$

$8 \cdot 6 \cdot 8 = 384$
$4 \cdot 3 \cdot 2 = 24$
$\frac{384}{24}$

8, 6, 4x4

19) Two similar cylinders have diameters with a ratio of 2 to 5. If the volume of the larger cylinder is 187.5π in^3, then what is the volume of the smaller cylinder?

ratio of similitude = $\frac{2}{5}$ $\qquad$ volume ratio = $\frac{8}{125}$ $\qquad \frac{8}{125} = \frac{x}{187.5\pi} \qquad \boxed{x = 12\pi \text{ in}^3}$

20) Two similar cubes have a ratio of 3 to 7. If the surface area of the smaller cube is 18 in^2, then what is the surface area of the larger cube?

ratio of sim = $\frac{3}{7}$ $\qquad$ SA ratio = $\frac{9}{49}$ $\qquad \frac{9}{49} = \frac{18}{x} \qquad \boxed{x = 98 \text{ in}^2}$

21) An oil tank is cylindrical in shape. The diameter is 100 feet and the height is 30 feet. If oil is drained at a rate of 6000 cubic feet per minute, then how many minutes will it take to drain the oil tank?

100, 30

$2500\pi \cdot 30 = 75000\pi = \frac{235619.449}{6000} \approx \boxed{39.3 \text{ min}}$

22) Incense can be made in the shape of a cone. The cones are 3 inches tall with a radius of 2 inches. The material for making the incense comes in rectangular prisms and must be ground down and reshaped to form the cones. If the prism is 6 inches long, 4 inches wide, and 8 inches tall, then how many cones can be made?
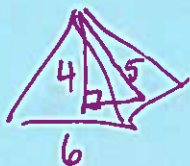
$6 \times 4 \times 8$ $\qquad 192$
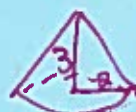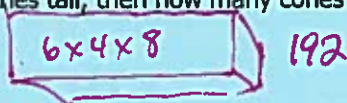
$\frac{1}{3}(4\pi) \cdot 3 = 4\pi \approx 12.57 \qquad \frac{192}{12.57}$

$\boxed{15 \text{ cones}}$

23) A square pyramid has a base edge that is 6 feet and a slant height of 5 feet. The pyramid is made of solid gold. If the pyramid is melted down, how many bars that are 1 foot long, .5 foot wide, and .5 foot tall can be from the pyramid?

$4, 5, 6$

$\frac{1}{3}(36)(4) = 48$

$1 \times .5 \times .5 = .25$

$\frac{48}{.25} = \boxed{192 \text{ bars}}$