

Unit I Exam Review

1. Consider the sphere at the right.

- a. Find its surface area.

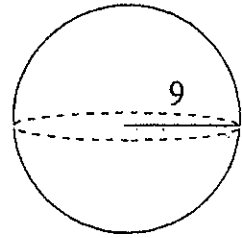
$$SA = 4\pi r^2$$

$$= 4 \cdot \pi \cdot 9^2 = 1,017.9 \text{ units}^2$$

- b. Find its volume.

$$V = \frac{4}{3} \cdot \pi r^3$$

$$\frac{4}{3} \cdot \pi \cdot 9^3 = 3,053.6 \text{ units}^3$$



2. A sphere has radius 1.2 m. What is its **surface area** to the nearest tenth of a square meter?

$$SA = 4\pi r^2$$

$$= 4\pi \cdot 1.2^2 = \boxed{18.1 \text{ m}^2}$$

3. A sphere has diameter 4.0 cm. What is its **volume**, to the nearest tenth of a centimeter? $r = 2 \text{ cm}$

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

$$\frac{4}{3} \cdot \pi \cdot 2^3 = \boxed{33.5 \text{ cm}^3}$$

4. A right square prism has base edge length 7 and height 12. Find...

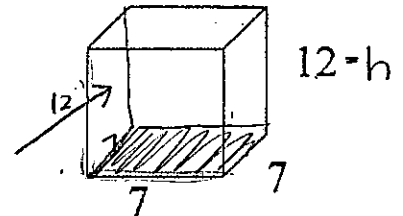
- a. its volume. $7 \cdot 7 = 49$

$$\begin{array}{r} \times 12 \\ 49 \\ \hline 588 \end{array}$$

$$\boxed{588 \text{ units}^3}$$

- b. its surface area.

$$\begin{array}{ll} B: 49 & R: 84 \\ T: 49 & F: 84 \\ L: 12 \cdot 7 = 84 & B: 84 \end{array} \quad \left. \vphantom{\begin{array}{ll} B: 49 & R: 84 \\ T: 49 & F: 84 \\ L: 12 \cdot 7 = 84 & B: 84 \end{array}} \right\} = \boxed{434 \text{ units}^2}$$



5. Suppose all the dimensions of a right rectangular prism are multiplied by 5.

- a. What happens to its surface area?

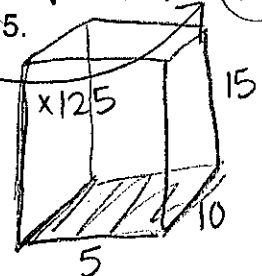
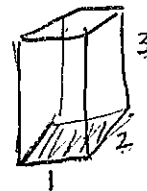
multiplied by 25

- b. What happens to its volume?

125 times bigger

$$V = 1 \cdot 2 \cdot 3 = \boxed{6}$$

$$V = 5 \cdot 10 \cdot 15 = \boxed{750}$$

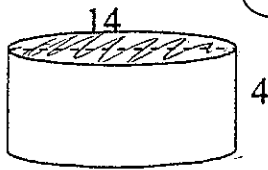


$$\begin{array}{ll} F: 3 & B: 3 \\ B: 2 & T: 2 \\ L: 6 & R: 6 \end{array}$$

$$\begin{array}{ll} F: 75 & B: 75 \\ B: 50 & T: 50 \\ L: 150 & R: 150 \end{array}$$

$$SA = 22 \quad \times 25 \quad SA = 550$$

6. Find the **exact volume** of a right cylinder with diameter of 14 and height 4. $r=7$

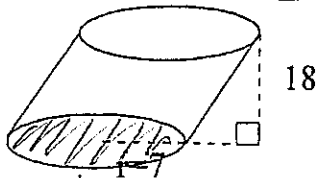


$$\pi \cdot r^2 \rightarrow 49\pi \times 4 = 196\pi \text{ units}^3$$

$$\pi \cdot 7^2$$

$$153.9 \times 4 = 615.6 \text{ units}^3$$

7. Find the **exact volume** of the oblique cylinder below.



$$\pi \cdot 7^2$$

$$49\pi$$

$$\times 18 \rightarrow 882\pi \text{ units}^3 \text{ or } 2,770.9$$

8. The volume of a sphere is 3,000 in³. Give the **radius** of the sphere to the nearest hundredth.

$$V = \frac{4}{3} \cdot \pi \cdot r^3$$

$$\frac{3000}{\frac{4}{3}} = \frac{\frac{4}{3} \pi r^3}{\frac{4}{3}}$$

$$2250 = \frac{\pi r^3}{\pi}$$

$$\sqrt[3]{716.2} = \sqrt[3]{r^3}$$

$$r = 8.9 \text{ in}$$

9. The surface area of a sphere is 400 cm². Give the **radius** of the sphere to the nearest tenth.

$$SA = 4\pi r^2$$

$$\frac{400}{4} = \frac{4\pi r^2}{4}$$

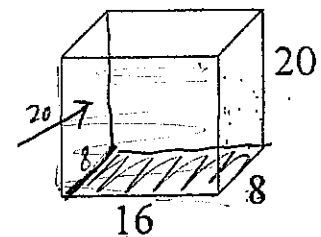
$$\frac{100}{\pi} = \frac{\pi r^2}{\pi}$$

$$\sqrt{31.8} = \sqrt{r^2}$$

$$r = 5.6 \text{ cm}$$

10. A right rectangular prism has dimensions 8, 16, and 20. Find:

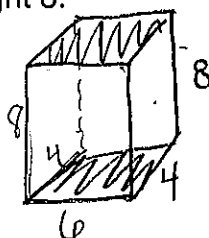
a. its volume. $16 \cdot 8 \cdot 20 = 2,560 \text{ units}^3$



- b. its surface area.

$$\left. \begin{array}{ll} B: 128 & T: 128 \\ L: 160 & R: 160 \\ F: 320 & B: 320 \end{array} \right\} 1216 \text{ units}^2$$

11. Find the **lateral area** of a right rectangular prism with width 4, length 6, and height 8.



$$\rightarrow \text{bases}$$

$$\left. \begin{array}{l} F: 6 \cdot 8 = 48 \\ B: 48 \\ L: 8 \cdot 4 = 32 \\ R: 32 \end{array} \right\} 160 \text{ units}^2$$

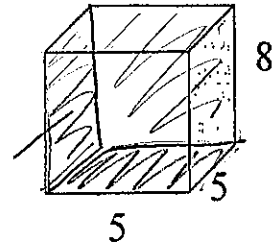
12. A right square prism has base edge length 5 and height 8. Find:

a. its volume. $5 \times 5 \times 8 = 200 \text{ units}^3$

- b. its surface area.

$B: 25$ $T: 25$
 $L: 40$ $R: 40$
 $B: 40$ $F: 40$

210 units^2



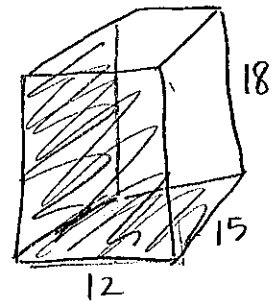
13. A box has dimensions 12 ft, 15 ft, and 18 ft. Find:

a. its volume. $12 \times 15 \times 18 = 3,240 \text{ ft}^3$

- b. its surface area.

$B: 180$ $T: 180$
 $L: 270$ $R: 270$
 $F: 216$ $B: 216$

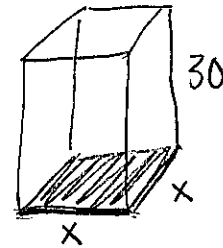
$1,332 \text{ ft}^2$



14. The volume of a prism with a square base is $1,080 \text{ cm}^3$, and its height is 30 cm. Find:

a. the area of the its base. $x \cdot x \cdot 30 = 1080$
 $6 \cdot 6 = 36$

b. the length of a side of the base. $\sqrt{x^2} = \sqrt{36}$
 $x = 6$

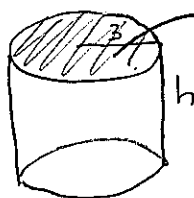


15. A cube has volume $2,197 \text{ mm}^3$. Find the length of an edge of the cube.

$V = s^3$
 $\sqrt[3]{2197} = \sqrt[3]{s^3}$

$s = 13 \text{ mm}$

16. The volume of a cylinder is $72\pi \text{ cm}^3$. If its radius is 3 cm, what is its **height**?



$\pi \cdot r^2$
 $\pi \cdot 3^2$
 $28.27 \cdot h = 72\pi$
 $h = 8 \text{ cm}$

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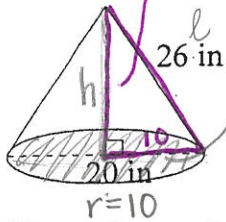
$$a^2 + b^2 = c^2$$

$$10^2 + h^2 = 26^2$$

Date: _____

Hour: _____

17. Find the volume of the cone below.



$$\pi r^2$$

$$\pi \cdot 10^2 = 314.2$$

$$\times 24$$

$$7540.8$$

$\div 3 =$

$$2,513.6 \text{ in}^3$$

18. The volume of a cone is $125\pi \text{ cm}^3$. If its radius is 5 cm, what is its **height**?



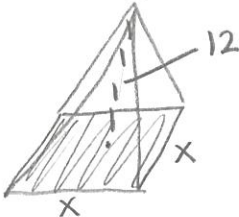
$$\pi \cdot 5^2 = 78.5$$

$$3 \cdot 78.5 \cdot h = 125\pi \cdot 3$$

$$78.5 \cdot h = \frac{1178.1}{78.5}$$

$$h = 15 \text{ cm}$$

19. A pyramid has a square base. Its volume is 324 mm^3 . If its height is 12 mm, what is the **length of a base edge**?



$$3 \cdot \frac{x^2 \cdot 12}{3} = 324 \cdot 3$$

$$\frac{x^2 \cdot 12}{12} = \frac{972}{12}$$

$$\sqrt{x^2} = \sqrt{81}$$

$$x = 9 \text{ mm}$$

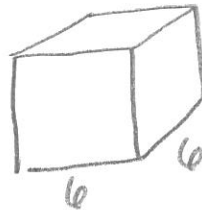
20. A cube has a surface area of 216 cm^2 . Find its **volume**.

$$SA = 6s^2$$

$$\frac{216}{6} = \frac{6s^2}{6}$$

$$\sqrt{36} = \sqrt{s^2}$$

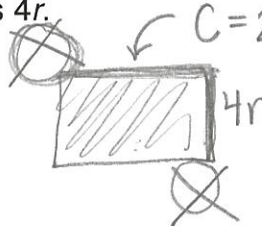
$$s = 6$$



$$V = 6 \cdot 6 \cdot 6$$

$$= 216 \text{ cm}^3$$

21. What is the formula for determining the **lateral area** of a right cylinder if its radius is r and its height is $4r$.



$$2\pi r \cdot 4r$$

$$8r^2 \pi$$

22. A sphere has circumference 24π . Find the **volume** of the sphere.

$$C = 2 \cdot \pi \cdot r$$

$$\frac{24\pi}{2\pi} = \frac{2 \cdot \pi \cdot r}{2\pi}$$

$$12 = r$$

$$V = \frac{4}{3} \cdot \pi \cdot r^3$$

$$\frac{4}{3} \cdot \pi \cdot 12^3$$

$$7,238.2 \text{ units}^3$$