Chapter 8 Test, Form 3A

Write and solve an equation to determine the value of $x$ in each figure. \textbf{TEKS 7.11(C)}

1. \begin{align*}
(3x)° &= 84° \\
3x &= 84; 28
\end{align*}

2. \begin{align*}
(4x)° + 46° &= 90° \\
4x + 46 &= 90; 11
\end{align*}

3. \begin{align*}
x° + (180 - 160) &= 90° \\
x + 20 &= 90; 70
\end{align*}

4. \begin{align*}
(5x)° - 75° &= 0° \\
5x &= 75; 15
\end{align*}

Determine the value of $x$ in each triangle. Then classify the triangle as \textit{acute}, \textit{right}, or \textit{obtuse}. \textbf{TEKS 7.11(C)}

5. \begin{align*}
29° + x° + 88° &= 180° \\
x &= 63; \text{ acute}
\end{align*}

6. \begin{align*}
42° + x° + 48° &= 180° \\
x &= 90; \text{ right}
\end{align*}

Determine the volume of each figure. Round to the nearest tenth if necessary. \textbf{TEKS 7.9(A)}

7. \begin{align*}
\text{Volume} &= \text{length} \times \text{width} \times \text{height} \\
&= 5.4 \times 2 \times 7.1 \\
&= 76.7 \text{ in}^3
\end{align*}

8. \begin{align*}
\text{Volume} &= \frac{1}{3} \times \text{base} \times \text{height} \\
&= \frac{1}{3} \times 20 \times 5 \times 18 \\
&= 600 \text{ m}^3
\end{align*}

9. A storage shed with a flat roof is 4 yards long by 3 yards wide by 2\ 1/2 yards tall. A cubic yard is equal to 27 cubic feet. How many cubic feet of storage space does the shed enclose? \textbf{TEKS 7.9(A)}

\begin{align*}
\text{Volume} &= \text{length} \times \text{width} \times \text{height} \\
&= 4 \times 3 \times 2.5 \times 27 \\
&= 810 \text{ ft}^3
\end{align*}

10. Determine the area of the circle. Use 3.14 or \(\frac{22}{7}\) for \(\pi\). Round to the nearest tenth. \textbf{TEKS 7.8(C)}

\begin{align*}
\text{Area} &= \pi \times \text{radius}^2 \\
&= 3.14 \times 34^2 \\
&= 3796.8 \\
&= 907.5 \text{ in}^2
\end{align*}
11. Determine the volume of the square pyramid at the right. Round to the nearest tenth.  
\[ \text{Volume} = \frac{1}{3} \times (13 \times 11 \times 13) = 619.7 \text{ m}^3 \]

12. A carpenter is framing a rectangular wooden block that is 20 inches long, 12 inches wide, and 10 inches high. He wants to paint the lateral surface of the wooden block. He has one container of paint that covers 400 square inches. Does he have enough paint to paint the lateral surface area of the block? Justify your answer.  
**Sample answer:** no; the lateral surface area of the wooden block is 640 in\(^2\) and that is greater than 400 in\(^2\).

13. A green box measures 4 feet by 5 feet by 6.5 feet. An orange box measures 5 feet by 3.5 feet by 6 feet. Which box has greater volume? Explain.  
**green;** 130 ft\(^3\) \(>\) 105 ft\(^3\)

14. A drawer is shaped like a rectangular prism. It has a length of 17 inches and a height of 6 inches. The volume is 1,428 cubic inches. Find the width of the drawer.  
14 in.

15. A rectangular pyramid has a volume of 190 cubic centimeters. Find two possible sets of measurements for the base area and height of the pyramid.  
**Sample answer:** base area equals 57 cm\(^2\) and height equals 10 cm; base area equals 38 cm\(^2\) and height equals 15 cm

Use a problem-solving model to solve each problem.

16. The circumference of a top of the circular table is 37.68 centimeters. What is the area of the top of the table? Use 3.14 for \(\pi\). Round to the nearest whole number. (Hint: The circumference of a circle \(C = 2\pi r\), where \(r\) is the radius.)  
\[ \text{Area} = \pi \times (12)^2 = 113 \text{ cm}^2 \]

17. Determine the volume and surface area of the composite figure.  
\[ \text{Volume} = 480 \text{ m}^3, \text{ Surface Area} = 384 \text{ m}^2 \]

18. If the height and the base length of a square pyramid are each doubled, how does the volume of the pyramid change?  
**The volume is 8 times the original volume.**

19. John wants to cut the circular piece from a wooden plank and make a design as shown. Determine the area of the shaded region. Use 3.14 for \(\pi\).  
\[ \text{Area} = 30.96 \text{ cm}^2 \]