1. The area of a triangle is 24 square centimeters. If the base of this triangle is 8 centimeters, find the number of centimeters in the altitude. 
   \[
   A = \frac{1}{2}bh \\
   24 = \frac{1}{2}(8)h \\
   h = 3 \text{ cm}
   \]

2. Find the area of a right triangle whose legs have lengths 6 and 8.
   \[
   A = \frac{1}{2} \times 6 \times 8 = 24
   \]

3. A garden in the shape of an equilateral triangle has sides whose lengths are 10 meters. What is the area of the garden?
   \[
   A = \frac{\sqrt{3}}{4} \times 10^2 = 25 \sqrt{3} \approx 43.3 
   \]

4. Find the perimeter of a square whose area is 25.
   \[
   a^2 = 25 \Rightarrow a = 5 \\
   P = 4a = 20
   \]

5. Which figure has the largest area?
   A. a square whose side measures 6 
   B. a circle whose diameter measures 6 
   C. a triangle whose base and height each measures 6 
   D. an equilateral triangle whose side measures 6 
   \[
   A_{\text{circle}} = \pi \times 3^2 = 9\pi \\
   A_{\text{triangle}} = \frac{1}{2} \times 6 \times 3 = 9 \\
   A_{\text{equilateral}} = \frac{\sqrt{3}}{4} \times 6^2 = 9\sqrt{3} \\
   \]
   Therefore, the circle has the largest area.

6. The bases of a trapezoid have lengths 10 and 18. If the height of the trapezoid is 6, what is the area of the trapezoid?
   \[
   A = \frac{1}{2} (b_1 + b_2)h \\
   A = \frac{1}{2} (10 + 18) \times 6 = 72
   \]

7. In a rectangle, the length is twice the width, and the perimeter is 48. Find the area of the rectangle.
   \[
   2l + 2w = 48 \Rightarrow l = 2w \\
   \]
   Substituting into the area formula:
   \[
   A = lw = 2w^2
   \]

8. Mr. Santana wants to carpet exactly half of his rectangular living room. He knows that the perimeter of the room is 96 feet and that the length of the room is 6 feet longer than the width. How many square feet of carpeting does Mr. Santana need?
   \[
   l = w + 6 \\
   2(l + w) = 96 \Rightarrow l = 30, w = 24 \\
   \]
   Area of the entire room:
   \[
   A = lw = 720 \\
   \]
   Area of half the room:
   \[
   360 \text{ sq. ft.}
   \]

9. What is the volume, in cubic centimeters, of a cube whose edge measures 2 centimeters?
   \[
   V = s^3 = 8 \text{ cm}^3
   \]

10. The volume of a rectangular solid is 180 cubic centimeters. The length is 10 centimeters and the width is 4 centimeters. Using the formula
    \[ V = lwh, \]
    find the number of centimeters in the height.
    \[
    V = 180 = 10(4)h \\
    h = \frac{180}{40} = 4.5
    \]

11. If the length of each side of a triangle is doubled, then its perimeter
    A. remains the same \hspace{1cm} B. is multiplied by 2 \hspace{1cm} C. is multiplied by 4 \hspace{1cm} D. is increased by 4
    \[
    P = a + b + c \\
    \]
    Let the original side lengths be \(a, b, c\); then the new side lengths are \(2a, 2b, 2c\).
    \[
    P_{\text{new}} = 2a + 2b + 2c = 2(a + b + c) = 2P
    \]
    Therefore, the perimeter is multiplied by 2.

12. If the radius of a circle is doubled, then the circumference of the circle is multiplied by
    A. \(\frac{1}{2}\) \hspace{1cm} B. 2 \hspace{1cm} C. 16 \hspace{1cm} D. 4
    \[
    C = 2\pi r
    \]
    Let the original radius be \(r\); then the new radius is \(2r\).
    \[
    C_{\text{new}} = 2\pi(2r) = 4\pi r
    \]
    Therefore, the circumference is multiplied by 4.
13. The lengths of the sides of a triangle are represented by $x + 2$, $3x - 2$, and $2x + 5$. Express the perimeter of the triangle as a binomial in terms of $x$.

$$P = (x + 2) + (3x - 2) + (2x + 5)$$

$$P = 6x + 5$$

14. The radius of a circle is represented by $3x + 2$, and the length of the diameter is 22 centimeters. Find the value of $x$, in centimeters.

$$d = 2r$$
$$22 = 2(3x + 2)$$
$$22 = 6x + 4$$
$$18 = 6x$$
$$3 = x$$

$$x = 3 cm$$

15. If the length of a side of a cube is $7x$, which expression represents the cube's volume?

A. $7x^3$  
B. $49x^3$  
C. $343x$  
D. $343x^3$

$$V = l \times w \times h$$

$$V = (7x)(7x)(7x)$$

$$V = 343x^3$$

16. The width of a rectangle is 3 less than twice the length, $x$. If the area of the rectangle is 43 square feet, which equation can be used to find the length, in feet?

A. $2x(x - 3) = 43$  
B. $x(3 - 2x) = 43$  
C. $2x + 2(2x - 3) = 43$  
D. $x(2x - 3) = 43$

$$A = l \times w$$

$$43 = x(2x - 3)$$