You will need to remember the following formulas for this lesson.

Area of a rectangle: \( A = wL \) (Area = length \( \times \) width)
Volume of a rectangular prism (box): \( V = LwH \) (Volume = length \( \times \) width \( \times \) height)

**Ex 1:**  

a) Represent the volume of a box that is \( n \) inches high, \( n + 3 \) inches wide, and \( n + 8 \) inches long. Write as a function of \( n \).

b) Evaluate the volume when \( n \) is 3.

c) Represent the area of the base of the box as a function of \( n \) (\( A(n) \)). Find the area when \( n \) is 3.

d) Write a function of \( n \) to represent the area of the base if the length and width are both increased by 3. Show that this is the same as \( A(n + 3) \), using your function from part (c).
Ex 2:  a)  Write a polynomial function $V(x)$ to represent the volume of the box below.

\[
\begin{align*}
\text{Length: } & 6x - 1 \\
\text{Width: } & x \\
\text{Height: } & x + 10
\end{align*}
\]

b) Evaluate the volume of the box above if $x$ is 4.

c) Write a polynomial function $A(x)$ to represent the area of the bottom of the box and evaluate that area if $x$ is 12.

d) Write a polynomials function to represent the area of the bottom of the box if the length and width both increase by 3 units. Evaluate $A(x + 3)$. Notice anything?
Example 3   Write a polynomial that would represent the shaded region of the figure below.

4)   Represent (find) the area of the shaded region in the picture below.
Example 5: Write a polynomial that would represent the lighter shaded region of the figure below.

Ex6: An open box is formed from a rectangular piece of cardstock that is 24 inches by 16 inches by cutting equal squares from the corners and turning up the sides. If $x$ represents the side of each square, write an expression (function of $x$) to represent the volume of the box. (See picture.)
Example 7: An open-topped box is made by taking a rectangular piece of light card stock that is 24 inches by 36 inches and cutting equal squares from each corner and turning up the sides. If each square is $x$ on each side, write the volume of the open-topped box as a function of $x$.

Example 8: A square piece of paper is 48 cm per side. Strips of width $2x$ are cut from two adjacent sides of the square. Write an expression for the area of the remaining square as a function of $x$. 
Ex 9: Strips of width $x$ are cut from three sides of a square that is 28 inches on a side. (See figure below.) Write the area of the remaining square (shaded region) as a function of $x$.

Ex 10: Write a function of $x$ to represent the shaded region below.