MA 15910 Lesson 3b Notes

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)
Area of a triangle: $A = \frac{1}{2}bh$ (Area = $\frac{1}{2} \times$ base $\times$ height)

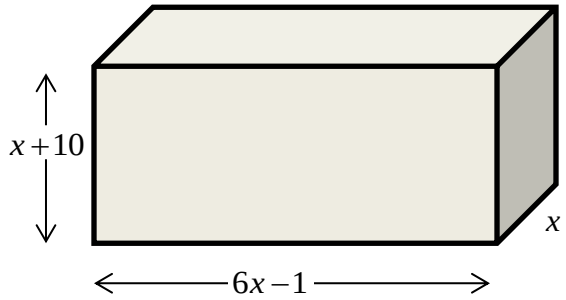
Ex 1: a) Represent the volume of a box that is n inches high, $n + 3$ inches wide, and $n + 8$ inches long. Write as a function of n.

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.

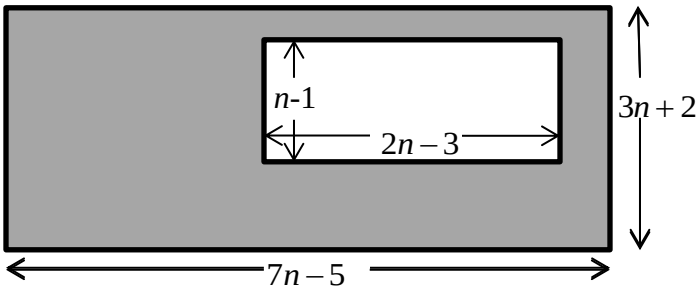


b) Evaluate the volume of the box above if x is 4.

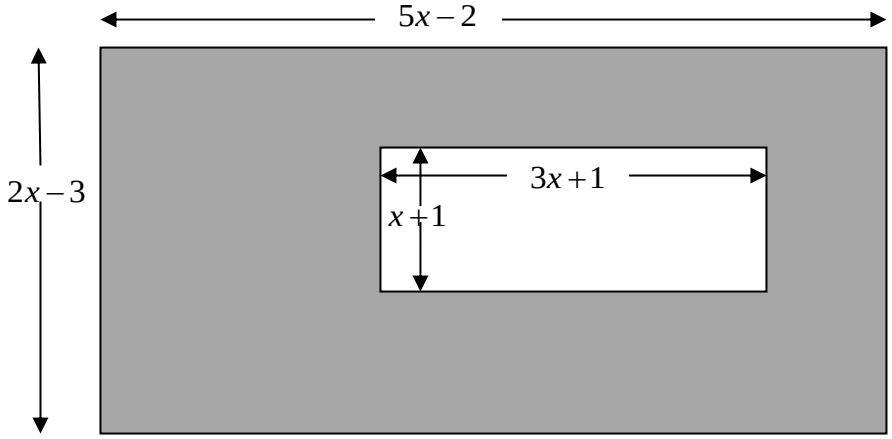
c) Write a polynomial function $A(x)$ to represent the area of the bottom of the box and evaluate that area if x is 12.

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?

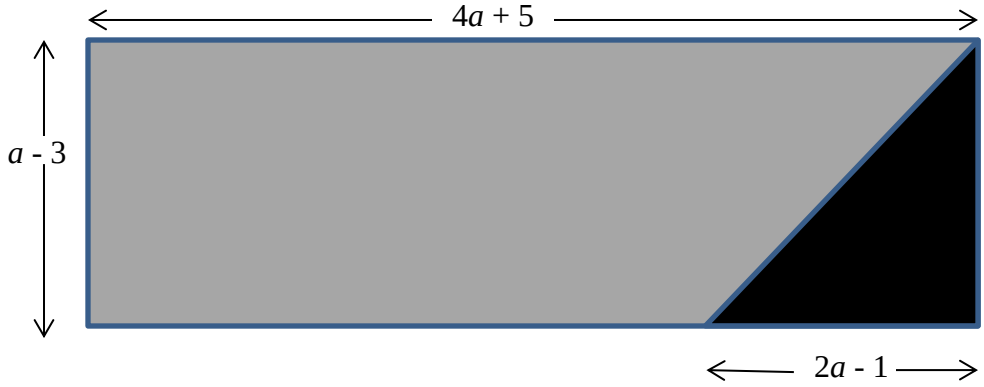
Example 3 Write a polynomial that would represent the shaded region of the figure below.



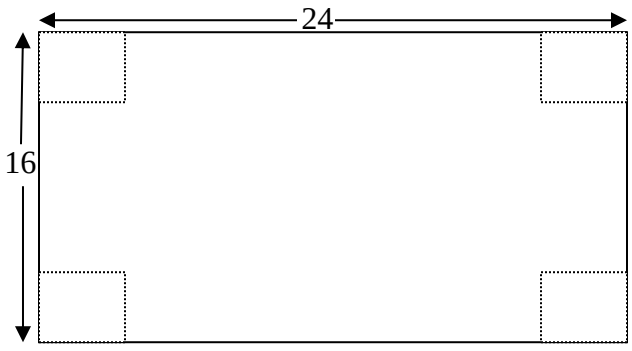
4) Represent (find) the area of the shaded region in the picture below.

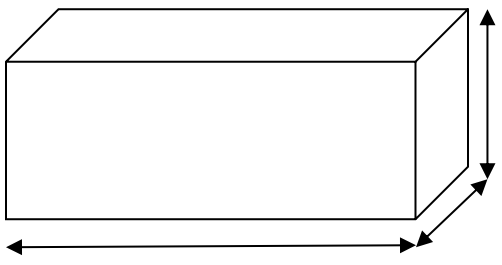


Example 5: Write a polynomial that would represent the lighter shaded region of the figure below.



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.)

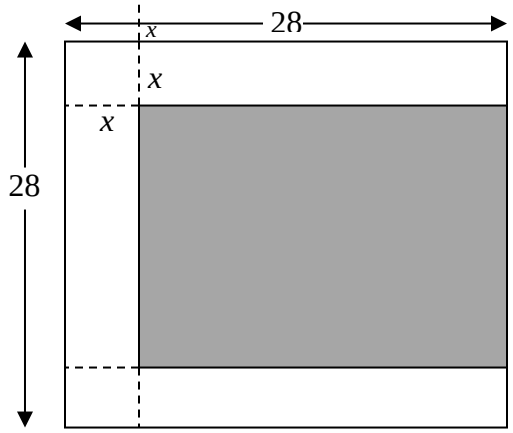




Example 7: An open-topped box is made by taking a rectangular piece of light card stock that is 24 inches by 36 inches and cutting equal squares from each corner and turning up the sides. If each square is x on each side, write the volume of the open-topped box as a function of x.

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 polynomial function of x.



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