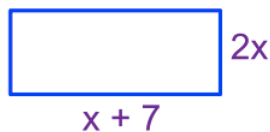
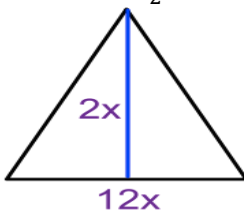


Polynomial Word Problems

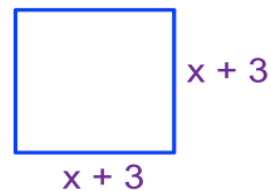
1) Find the area: $A=lw$



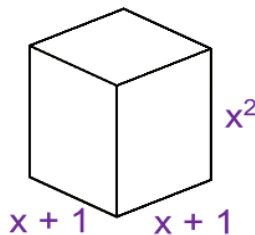
2) Find the area: $A = \frac{1}{2}bh$



3) Find the area: $A = \text{side}^2$



4) Find the volume of the prism: $V=lwh$



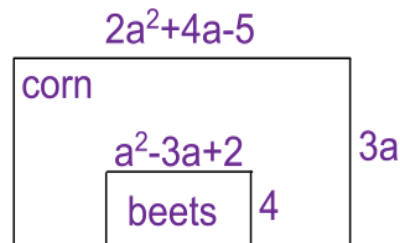
5) The number of pieces of furniture a certain furniture store sold since January can be modeled by the function $N(t) = 10t + 4$ and the price per piece of furniture can be modeled by $P(t) = 2.5t^2 - 12t + 65$, where t is the number of months since January. According to this model, what is the total amount of revenue generated by the furniture store's sales in December? Round your answer to the nearest cent.

Hint: $N(t) \cdot P(t)$ and let t be the number of months passed

6) The number of books sold since 2005 at a book store can be modeled by the function $N(t) = 5t + 36$ and the price per book can be modeled by $P(t) = 0.5t^2 - 3.2t + 8$, where t is the number of years since 2005. According to this model, what is the total amount of revenue generated by the store's book sales in the year 2011? Round your answer to the nearest cent.

7) A designer is making a rectangular prism box with maximum volume, with the sum of its length, width and height equal to 8 inches. The length must be twice the width. What should each dimension be? Round to the nearest tenth of an inch.

8) Find the area left for Leroy to grow corn in his garden. Use the picture below.



Operations on Functions

Perform the indicated operation.

1) $g(n) = n^2 + 2n + 4$
 $h(n) = -3n + 2$
Find $(g \cdot h)(1)$

2) $f(x) = 4x - 3$
 $g(x) = x^3 + 2x$
Find $(f - g)(4)$

3) $h(x) = 3x + 3$
 $g(x) = -4x + 1$
Find $(h + g)(10)$

4) $g(a) = 3a + 2$
 $f(a) = 2a - 4$
Find $\left(\frac{g}{f}\right)(3)$

5) $g(x) = -x^2 - 2x - 1$
 $f(x) = x + 5$
Find $(g - f)(x)$

6) $f(x) = 3x - 1$
 $g(x) = x^2 - x$
Find $\left(\frac{f}{g}\right)(x)$

7) $f(x) = 2x^3 - 5x^2$
 $g(x) = 2x - 1$
Find $(f \cdot g)(x)$

8) $h(t) = 2t + 1$
 $g(t) = -2t - 2$
Find $(h + g)(t)$

9) From 2000 to 2009, the number of births $b(x)$ in the U.S. can be modeled by the function $b(x) = -27x + 4103$, and the number of deaths $d(x)$ can be modeled by the function $d(x) = 23x + 2164$, where x is the number of years since 2000 and $b(x)$ and $d(x)$ are in thousands.

- The net increase in population P is the number of births per year minus the number of deaths per year or $P(x) = (b - d)(x)$. Write an expression that can be used to model the population increase in the U.S. from 2000 to 2009 in functions notation.
- Assume that births and deaths continue at the same rates. Estimate the net increase in population in 2020. Find $P(x) = (b - d)(20)$.

10) The function $f(x) = 1000 - 0.01x^2$ models the manufacturing cost per item when x items are produced, and $g(x) = 150 - 0.001x^2$ models the service cost per item.

- Write a function $C(x)$ for the **total** manufacturing and service cost per item.
- What is the total manufacturing and service cost if 3500 items are produced?