Math 12 – Workshop #9

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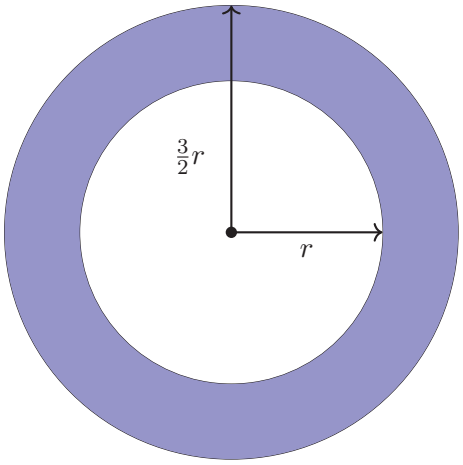
1. Consider the polynomial
$$p(x) = 4x^4 - 2x^5 + 3x + 6$$
   (a) What is the degree of this polynomial?
   (b) Write the polynomial in descending powers of x.
   (c) Identify the leading coefficient and the constant coefficient of $p(x)$.
   (d) Without a calculator find $p(0)$, $p(1)$, $p(-1)$, $p(2)$ and $p(-2)$.

2. Let $f(x) = x + 2$ and $g(x) = 2x + 3$
   (a) Find $f(x) - g(x)$
   (b) What is $f(3) - g(3)$?
   (c) Check your answer by computing $f(3)$ and $g(3)$ and then subtracting.

3. Create a polynomial with variable r which describes the area of the shaded region



   Simplify as much as possible.

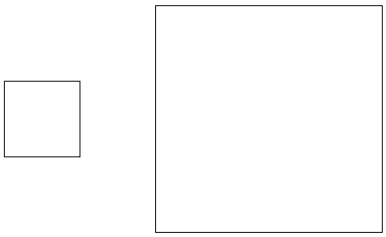
4. Suppose the directions on a problem were to simplify the left hand side of the following equation. The right hand side represents the first step in an attempted solution. Identify the error(s) in the work.
$$(3x + 2)^2 - (2x + 1) = 9x^2 + 4 - 2x + 1$$

5. Perform the operation and simplify completely
   (a) $3t + 7 - 2t + 4$
   (b) $4x(3y + z)$
   (c) $2x^2 + 3 - x(3x + 1)$
   (d) $(3a + 2b)(2 - a)$
   (e) $-3(t - 8)^2 - 12(t - 4)^2$
   (f) $3xy^2z(x^2 - 2y + z^3)$

6. The cost of producing x units of an item is given by the function $C(x) = 2x + 200$ in dollars, where the revenue for selling x units is given by $R(x) = 10x + 300$ in dollars.
   (a) What is $C(7)$? Explain your result in context.
   (b) What is $R(15)$? Explain your result in context.

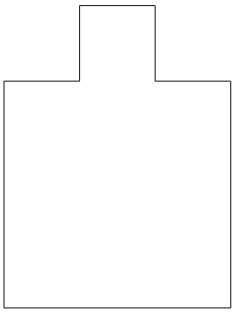
(c) Create a simplified polynomial $P(x)$ which gives profit in dollars. What is the profit if we produce and sell exactly 44 units?

7. Suppose you have a two squares. The larger square has sides 2 units longer than the sides of the smaller square.



(a) Give a polynomial which gives the cumulative perimeter of both squares where the variable is the length of a side of the smaller square. Simplify as much as possible.

(b) Suppose the squares from the previous problem are connected like so:



Give a polynomial which gives the perimeter of the above figure where the variable is the length of a side of the smaller square. Simplify as much as possible.