Problems of the Week (POWs) Assignments

Instructions: Write your solutions neatly on stapled sheets of paper with your name on top of each page. Your solution will be graded according to the official Oregon Scoring Guide (you can look it up at http://www.octm.org/assess.html), and thus your write up should include all your reasoning, and not just a final answer.

The emphasis of these assignments is on clear, complete and precise explanations. Please write your solutions in a way that a "typical" student in the 5-8th grade range will be able to follow it.

If you do not like the score you receive on your POWS (scores in the mid 20s would be what you should strive for), you could choose another one from each of the 6 assignments and turn your second attempt in by 5/31. Your scores from the two attempts will be averaged.

A. POW 1 Due 4/21: Choose one of problems below:

Terry has 34 wooden blocks. She wants to build the largest cube she can using as many of the blocks as possible. How many blocks are not used? Use words, pictures and numbers to explain your reasoning.

By using all the digits 0 through 9 exactly once, make a fraction equivalent to 1/3.

B. POW 2 Due 4/21: Choose one of problems below:

The measure of each interior angle of a triangle is a different prime number (measurements are in degrees). How many of these triangles exist and what are the measures of the angles of each triangle?

Toss a pair of dice and multiply the number of dots showing on the uppermost faces. What is the probability of getting a product that is a multiple of 3? A multiple of 5? A multiple of 3 or 5? A multiple of 3 and 5?

C. POW 3 Due 5/5: Choose one of problems below:

A rectangular box has front, left and top faces whose areas are 315 square inches, 168 square inches and 120 square inches respectively. What is the volume of the box?

Determine how many 6-digit palindromes exist and list them. Then find a prime whole number that is a divisor of every 4-digit palindrome. (An example of such a palindrome is 243342.)
D. POW 4 Due 5/5: Choose one of problems below:

Carlos started with an empty bank. Each day he put a penny, a dime, and a quarter in the bank. He kept this up until the bank contained an exact number of dollars, not a penny more or less. How many days did this take and how many dollars did the bank contain?

A merchant paid $30 for an article. He wishes to place a price tag on it so that he can offer a 10 percent discount on the price marked on the tag and still make a profit of 20 percent on the cost. What price should he mark on the tag?

E. POW 5 Due 6/5: Choose one of problems below:

Richard has difficulty saving money. As soon as he was a few dollars ahead, he would spend it. Recently, he had a tidy sum in the bank and then made three withdrawals. The first withdrawal cut his savings in half. The second one removed ¼ of what was left. The third one cut the remainder of his savings in half again and left him with $15 in the bank. How much did Richard have in his savings before he made the three withdrawals?

Five years ago, I planted a four-foot tall tree in the front yard. It has grown the same amount each year, and last year it was twice as tall as it was at the end of the first year. How tall is the tree now?

F. POW 6 Due 6/5: Choose one of problems below:

There are 13 steps in Wanda's staircase. One step squeaks every time someone steps on it. Last week, one friend started on step 1 and climbed to the top of the stairs taking 2 steps at a time. A second friend started from the floor and climbed to step 13 by taking 3 steps up and 1 step down. Even though Wanda was listening carefully, she heard no squeak each time. Which step is squeaky?

Find the sum of all positive integers less than 1,000 that are divisible by 3 but not by 2.