

Winter 2010

Problems of the Week (POWs) Assignments

Your solution will be graded according to the Math 396 POW Scoring Rubric, 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 a particular POW, you can choose the other POW from that assignment and turn in your solution by 3/8. Please attach the POW you wish to replace. I will average the scores of the two attempts.

These problems were taken from: www.eduplace.com, <http://www.cmc.uwaterloo.ca>, *Crossing the River with Dogs Instructor Resources* by Johnson, Herr and Kysh; *Problem Solving Through Recreational Mathematics* by Averbach and Chein.

POW 1 DUE 1/13: Choose one of the following two problems:

A number is formed using the digits 1, 2, ..., 9. Any digit can be used more than once, but adjacent digits cannot be the same. Once a pair of adjacent digits has occurred, that pair, in that order, cannot be used again. How many digits are in the largest such number?

Matt has a vinyl place mat that consists of a 10 by 10 grid. He thinks it has 100 squares, but then his older brother comes along and remarks, "Take another look. That mat has at least three times as many squares as you think!" How many squares does Matt's mat have?

POW 2 Due 1/27: Choose one of the following two problems:

A chicken and a half lay an egg and a half in a day and a half. How many eggs do 9 chickens lay in 6 days?

My cat is five times as old as my dog, and my spouse is three times as old as my cat. I am twice as old as my spouse, and my grandmother, who is as old as all of us put together, is 102 years old today. How old is my cat?

POW 3 Due 2/10: Choose one of the following two problems:

Al and Bert must arrive at a town 22.5 km away. They have one bicycle between them and must arrive at the same time. Bert sets out riding at 8 km/h, leaves the bicycle and then walks at 5 km/h. Al walks at 4 km/h, reaches the bicycle and rides at 10 km/h. For how many minutes was the bicycle not in motion?

A list of six positive integers p ; q ; r ; s ; t ; u satisfies $p < q < r < s < t < u$. There are exactly 15 pairs of numbers that can be formed by choosing two different numbers from this list. The sums of these 15 pairs of numbers are:

25; 30; 38; 41; 49; 52; 54; 63; 68; 76; 79; 90; 95; 103; 117:

Which sum equals $r + s$?