Standard "Writing the Math" Assignment

START   Write your name, date, topic of lesson, and class on your paper.

PART 1.   Copy **the problem** from the lesson and underline/highlight key words.

PART 2.   State your understanding of **what the problem is asking**.

PART 3.   **Answer** the problem.

PART 4.   **Explanation of strategy**.

PART 5.   Create **a new problem** that addresses the same mathematical understandings.

PART 6.   State the **answer to your new problem**.

Clearly label each of the six parts.

Grading Rubric

Each homework writing assignment is graded using a four point rubric, as follows:

Part 1. Statement of the problem.	$\frac{1}{2}$ point is awarded for correctly restating the original problem.
Part 2. Statement of what the problem is really asking.	$\frac{1}{2}$ point is awarded for correctly identifying what the problem is asking you to find or do.
Part 3. Solution to the problem.	$\frac{1}{2}$ point is awarded for a correct solution to the problem.
Part 4. Written analysis of the mathematics and solution strategy involved in the problem.	Up to 1 point is awarded for an explanation of the mathematics and solution strategy involved in the problem.
Part 5. An alternative version of the problem.	Up to 1 point is awarded for creating a new problem that involves similar mathematics and a similar solution strategy.
Part 6. Solution to the alternative version of the problem.	$\frac{1}{2}$ point is awarded for correctly solving the new problem that you have created.

This assignment/activity is designed to incorporate elements of Polya's four step universal algorithm for problem solving with the idea that writing is thinking.

Rationale for Assignment

Each New York Regents Algebra I (Common Core) examination contains 13 open response problems. An analysis of the first three Algebra I examinations revealed that approximately 51% (20 out of 39) of these open response problems instructed students to: 1) *describe;* 2) *state*; 2) *explain;* 3) *justify* or otherwise write about their answers. It is theorized that students can benefit from explicit instruction and writing routines that are applicable to solving these problems.

Mohammed Chen
October 11, 2015 – Finding the missing number in the average.
Class M

Part 1. **The Problem**

TOP Electronics is a small business with five employees. The mean (average) weekly salary for the five employees is $360. If the weekly salaries of four of the employees are $340, $340, $345, and $425, what is the salary of the fifth employee?

Part 2. **What is the problem asking?**

Find the salary of the fifth employee.

Part 3. **Answer**

The salary of the fifth employee is $350 per week.

Part 4. **Explanation of Strategy**

The arithmetic mean or average can be represented algebraically as:

$$\overline{X} = \frac{x_1 + x_2 + \dots + x_n}{n}$$

I put information from the problem into the formula. The problem says there are 5 employees, so $n = 5$. The problem also gives the mean (average) salary and the salaries of 4 of the employees. These numbers can be substituted into the formula as follows:

$$360 = \frac{340 + 340 + 345 + 425 + x_5}{5}$$

$$1800 = 340 + 340 + 345 + 425 + x_5$$

$$1800 = 1450 + x_5$$

$$1800 - 1450 = x_5$$

$$350 = x_5$$

Check: $360 = \dfrac{340 + 340 + 345 + 425 + 350}{5} = \dfrac{1800}{5} = 360$

Part 5. **A New Problem**

Joseph took five math exams this grading period and his average score on all of the exams is 88. He remembers that he received test scores of 78, 87, 94, and 96 on four of the examinations, but he has lost one examination and cannot remember what he scored on it. What was Joseph's score on the missing exam?

Part 6. **Answer to New Problem**

Joseph received a score of 85 on the missing examination.

EVALUATION

Name and Proper Heading		Part 4. Explanation of strategy.	*1 Point*
Part 1. Problem copied correctly?	*1/2 Point*	Part 5. New problem.	*1 Point*
Part 2. Understand the problem?	*1/2 Point*	Part 6. Solution to new problem.	*1/2 Point*
Part 3. Correct and complete answer?	*1/2 Point*	*TOTAL*	*4 Points*