Week 12 Enrichment: Problem-solving
Math 9 – Wolfe, Spring 2020

These problems are a great way to hone your problem-solving skills. While you will not be solving them for a grade this semester, you can ask me for help any time and I will happily give you hints and nudges in the right direction.

These enrichment problems are taken from the University of Waterloo's Problem of the Week. The four levels go up in difficulty, so you may find you only want to solve one or you may go all the way through. The problems for a single week all have a common theme or central concept.

The solutions for all these problems are online, too. The solutions are long and have a lot of notes for teachers who want to use them in class, but you can usually find the number answer near the bottom before the teacher's notes. Some have multiple solutions so you might have to pick through until you find yours.

I recommend using scratch paper, a white board, or a white board app to solve these problems. Don't take the process too seriously – mess around, make mistakes, and have a little fun.

These problems and solutions can be found at:

Problem A: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWA-19-NN-PA-01-P.pdf

   Solution: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWA-19-NN-PA-01-S.pdf

Problem B: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWB-19-NN-01-P.pdf

   Solution: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWB-19-NN-01-S.pdf

Problem C: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWC-19-NN-01-P.pdf

   Solution: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWC-19-NN-01-S.pdf

Problem D: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWD-19-NA-01-P.pdf

   Solution: https://www.cemc.uwaterloo.ca/resources/potw/2019-20/English/POTWD-19-NA-01-S.pdf

Problem of the Week
Problem A
Finding the Intersection

Isla starts with $12 in her bank account. She adds $12 to her account at the end of every two weeks from collecting recycled items. Javier starts with $32 in his bank account. He earns $4 at the end of every week for doing odd jobs for his neighbour, and adds that to his savings.

After how many weeks will they both have the same amount of money in their bank accounts?

Strands Patterning and Algebra, Number Sense and Numeration
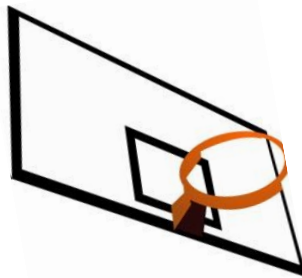
Problem of the Week
Problem B
More Practice

When Nick shoots a basketball, he either sinks the shot or misses. For each shot Nick sinks, he is given 5 points by his father. For each missed shot, Nick's Dad takes 2 points away.

Nick attempts a total of 28 shots and ends up with zero points (i.e., he breaks even). How many shots did Nick sink?

The above table may be useful. A sample trial of shots made and lost is shown.

Strand Number Sense and Numeration

| Shots Sunk	Points Gained	Shots Missed	Points Lost	Points Gained – Points Lost
20	100	8	16	100−16=84

Problem of the Week
Problem C
A Reporting Problem

Mildred has seven grades on her report card. The overall average of these seven grades is 77%.

After looking more closely at her report card, Mildred discovered that her English grade was incorrectly recorded as 18% instead of her actual grade of 81%.

Determine Mildred's correct report card average.

Report Card

77%

English → 18%

Strand Number Sense and Numeration
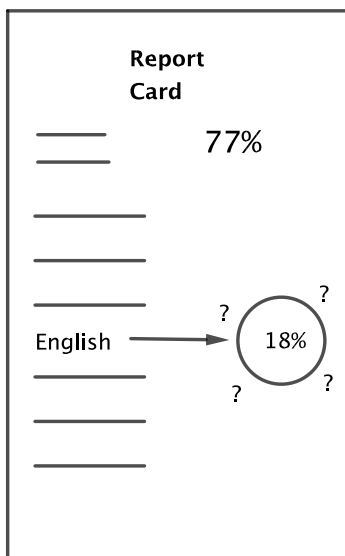
Problem of the Week
Problem D
An Average Report

A report card has six marks. The average of the first and second marks is 72%. The average of the second and third marks is 75%. The average of the third and fourth marks is 77%. The average of the fourth and fifth marks is 78%. The average of the fifth and sixth marks is 79%.

(a) Determine the overall average.

(b) Determine the average of the first and sixth marks.