MTH 225: Checkpoint 1

Welcome to your first Checkpoint. This quiz contains two problems, one for **Learning Target 1** and another for **Learning Target 2**. Each problem is an opportunity to give a *successful demonstration of skill* on the Learning Target as described in the syllabus. A successful demonstration of skill on a Learning Target here will move you to "Level 1" on that target.

Instructions:

- You do not need to work both problems if you do not feel ready to do so. Checkpoint 2 next week will provide another attempt on each.
- A basic scientific or graphing calculator is the only technology allowed. If you are using a smartphone app as your calculator, your phone *must* be switched to airplane mode. The use of any other technology, or phone apps with internet enabled, will be treated as academic dishonesty.
- You are not allowed any notes on Checkpoints.
- **Do all work on separate pages.** Note that space is *not* provided below for your work.
- **Put each Learning Target on its own page.** Please *do not* put both Learning Targets on the same page as this will interfere with the grading and return process. If you need two sides of a page for a single target, that's fine; but do not put two Learning Targets on the same piece of paper.
- Make sure to put your name on each page you are handing in.
- Note that each problem has *Success Criteria* listed. These are the standards for what constitutes a "successful" demonstration of skill. Make sure to read through those criteria and double check your work against them before turning in your work.

Learning Target 1

I can convert a positive integer from base 10 to base 2, 8, and 16 and vice versa and represent a negative integer in base 2 using two's complement notation.

Be sure to show your work and please put a circle or box around each answer.

- 1. Convert the base 10 integer 222 to binary (base 2) using the base conversion algorithm. (On this part, you *must* use the base conversion algorithm and no other method.)
- 2. Convert the base 8 integer 277 to base 10.
- 3. Convert the base 2 integer 1101 0110 to base 16.
- 4. The 8-bit binary representation of the base 10 integer 77 is 01001101. Write the 8-bit binary representation of -77 using two's complement.

Success criteria: All four answers are correct, and the work leading to each answer is clear and legible. Up to two "simple errors" (as described in the *Standards for Student Work* document) are allowed. The first part must use the base conversion algorithm we learned in class.

Learning Target 2

(CORE) I can add, subtract, multiply, and divide positive integers in base 2.

- 1. Add the base-2 integers 10011100 and 0110111. Show your work and circle your answer.
- 2. Subtract the base-2 integers 10011100 and 0110111. **Show your work and circle your answer**.
- 3. Multiply the base-2 integers 11011 and 110. **Show your work and circle your answer**.
- 4. Divide the base-2 integer 11001101 by 110. **Show your work and circle your answer**.

Success criteria: All four answers are correct, and the work leading to each answer is clear and legible. Up to two "simple errors" (as described in the *Standards for Student Work* document) are allowed.