Problem Set 4

1. List all factors of 60.

2. Consider a rectangle with sides 18 cm and 0.4 m long. (1 meter = 100 centimeters).

   a) Compute the perimeter of the rectangle in centimeters. Include units in your computation and answer.

   b) Compute the area of the rectangle in square centimeters. Include units in your computation and answer.

3. Simplify each of the following expressions by applying the order of operations agreement. **Show all steps. Perform only one operation in each step.**

   a) $7 \cdot 3^2 - (3 - 2^2 \cdot 5 - 1) \div 2$

   b) $\sqrt{-49}$

   c) $\sqrt{169 - 144}$

   d) $\sqrt{169} - \sqrt{144}$

   e) $2^3 - 2\left(5 - (-3)^2\right)^2$

   f) $\left(\left((8-5)^2 - 7\right)^2 - 2\right)^2 - 1$

   g) $\dfrac{4^2 + 5^2 - 6 \div 2 \cdot 3}{4^2 - 8 \cdot 2}$

   h) $3 + 2\left(5 + 3\left(15 - 2^3\right) - 2^2 - 1\right)$

   i) $4\left(3\left(2(2^2 - 1) - 1\right) - 1\right) + 5$

   j) $\sqrt{\sqrt{36} + 5\sqrt{9} - \sqrt{25}}$

4. Let $p = 4$, $q = -3$, and $s = 1$. Evaluate each of the following expressions.

   a) $\dfrac{p - q - s}{p + q + s}$ b) $\dfrac{2p - q}{p - (s - q)}$ c) $p^2 - 2s^2$ d) $p^2 - (2s)^2$ e) $2pq^2$

5. Simplify each of the following.

   a) $3(2x - 4) - 5(2x + 1)$ b) $(m - 3)^2$ c) $(a + b)(a - b)$ d) $(2x - 1)(3x + 5) - 2(x - 2)^2$

6. a) Expand $(x + 5)^2$

   b) Expand $(-x - 5)^2$

   c) Explain the connection between the results for parts a) and b).