Problem of the Week
Problem A and Solution
Sorting Socks

Problem

Jessie is organizing her sock drawer by arranging her socks in rows.

She notices that if she puts 5 pairs of socks in each row, there will be one row with only 1 pair of socks. Also, if she puts 3 pairs of socks in each row, there will be one row with only 2 pairs of socks.

If Jessie has fewer than 60 pairs of socks, what is the maximum number of socks she could have?

Solution

One way to solve this problem is to use skip counting. Since there are extra socks in one of the rows, we count up to but not including 60.

If she puts 5 pairs of socks in each row, then the total number of socks in the filled rows could be:

$$5, 10, 15, 20, 25, 30, 35, 40, 45, 50, \text{ or } 55.$$

Since there is another row with only 1 pair of socks, the total number of socks for each of these options is:

$$6, 11, 16, 21, 26, 31, 36, 41, 46, 51, \text{ or } 56.$$

If she puts 3 pairs of socks in each row, then the total number of socks in the filled rows could be:

$$3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, \text{ or } 57.$$

Since there is another row with only 2 pairs of socks, the total number of socks for each of these options is:

$$5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 56, \text{ or } 59.$$

We need to find the largest common number in the two lists containing the possible total number of socks. This number is 56.

Therefore, the maximum total number of socks Jessie could have is 56.