Set Theory
Quiz 3

Name:_____

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

Let $A = \{2, 3, 4, \ldots, 10\}$ and let $f\colon A \to A$ be the function defined by the rule "$f(n)$ equals the largest prime factor of n".

1. Write down the image and coimage of f.

$\mathrm{im}(f) = \{2, 3, 5, 7\}$.

$\mathrm{coim}(f) = \{f^{-1}(2), f^{-1}(3), f^{-1}(5), f^{-1}(7)\} = \{\{2, 4, 8\}, \{3, 6, 9\}, \{5, 10\}, \{7\}\}$.

2. How many pairs are in the kernel of f?

The coimage cells have sizes $3, 3, 2, 1$, so the number of pairs in the kernel is $3^2 + 3^2 + 2^2 + 1^2 = 23$.