Example for Collections of Sets lecture

Suppose that $A = \{2, 3, 4, 5, 10, 12\}$. Let's define a function $F : A \to \mathbb{P}(A)$ and a set S as follows:

$$
\begin{aligned}
F(x) &= \{y \in A \mid y \text{ is a factor of } x\} \\
S &= \{F(x) \mid x \in A\}
\end{aligned}
$$

List the members of $F(12)$.

List the members of S

Is S a partition of A? Why or why not?

Example for Collections of Sets lecture

Let $A = \{2, 5, 7, 8, 13, 21\}$. Define $p : A \to \mathbb{P}(A)$ by $p(n) = \{s \in A \mid \gcd(s, n) \neq 1\}$.

(a) Give the value of $p(7)$.

(b) Let $M = \{p(s) \mid s \in A\}$. Evaluate/List out the elements of M.

$M = \Big\{$ $\Big\}$

(c) Is M a partition of A? Justify your answer by explaining why M satisfies, or doesn't satisfy, each of the three defining properties of a partition.