Number Theory Homework Week 8

Recall $τ\left(n\right)=\sum\_{d|n}^{}1$ and $σ\left(n\right)=\sum\_{d|n}^{}d$.

Let $n=30$.

Using Mobius do the following.

1. Show that $1=\sum\_{d|n}^{}μ(d)τ\left(\frac{n}{d}\right)$.
2. Show that $n=\sum\_{d|n}^{}μ(d)σ\left(\frac{n}{d}\right)$.
3. Find $φ\left(n\right).$
4. Find $\sum\_{d|n}^{}φ\left(d\right).$
5. Find $\sum\_{d|n}^{}μ(d)\frac{n}{d}$.

5 pts each