UH Math 3330-01 Dr.Heier-Spring 2017
HW10 Key

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Problem1. (1) K/H is a subset of G/H and K/H is itself a group.

(2)by showing for every $kH \in K/H$, $gH \in G/H$, $(gH)(kH)(g^{-1}H) = gkg^{-1}H = k'H$ for some $k' \in K$.

Problem2. By first isomorphism theorem we have $H \simeq G/ker\phi$ so $|H| = [G : ker\phi]$.

Problem3. Consider the canonical surjective map $\pi : K \to K/J$, then since ϕ is surjective, $\pi \circ \phi$ is a surjective homomorphism from G to K/J. The result follows from first isomorphism theorem.

Problem4. omitted.