Stochastic Analysis, WS18/19, Sheet 3

1. Show that for every $p < 1/2$ the paths of Brownian motion are p-Hölder continuous on every compact interval. Hint: consider $\mathbb{E}[|B_t - B_s|^m]$ for large m.

2. Let $M = (M)_{t\in[0,1]}$ be a continuous martingale. Show that there exists a version of M which has (almost surely) only discontinuous paths.

3. Let $M = (M)_{t\in[0,1]}$ be a continuous martingale. Show that there exists a version of M which has paths that are nowhere continuous.