(1) This is a closed book, closed notes exam. Switch off your cell phone and do not communicate with anyone other than an exam proctor.

(2) Start writing when instructed. Stop writing when your time is up.

(3) When you are ready to submit, please stay in your seat and raise your hand.

(1) (5 Points) Let $x$ and $z$ be integers between 0 and 3. Write down the feature space for the following kernel function.

$$K(x, z) = \min(x, z) + 1$$

(2) (5 Points) Let $x$ and $z$ be $d$-dimensional vectors, and let

$$K(x, z) = 2\langle x, z \rangle - 1$$

Prove that $K$ is not a kernel.