UW Math Circle
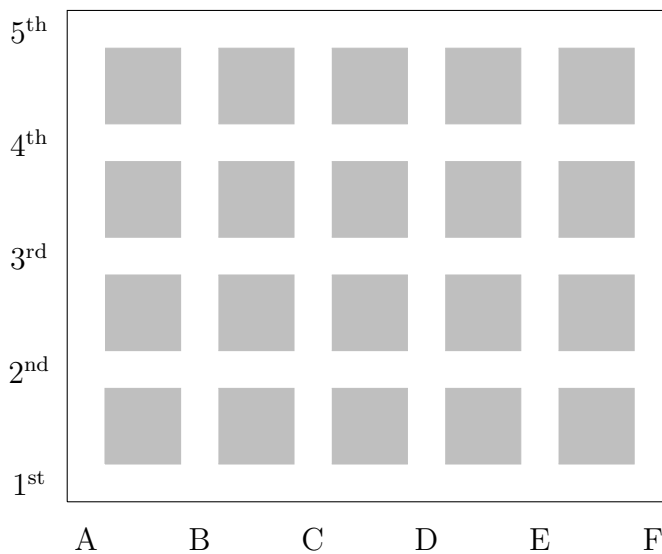May 2, 2013

1. Brave Sir Cosmo has an entourage of 4 knights, 9 squires, and 11 pages.

   (a) In how many ways can Sir Cosmo appoint a president, a vice president, and a horse handler if:

      i. the president is a knight, the vice president is a squire, and the horse handler is a page?
      ii. the president and vice president are both knights, and the horse handler is a squire?
      iii. the president and vice president are both knights, and the horse handler is either a knight or a page?

   (b) In how many ways can Sir Cosmo...

      i. choose two squires to accompany him to the olympics?
      ii. choose four squires to accompany him to the olympics?
      iii. choose five squires to accompany him to the olympics?
      iv. choose some knights to accompany him to the olympics?

2. A taxi cab is parked at the corner of 1st street and Avenue A. In order to guarantee the cheapest fare for its customers, the taxi can only drive north and east. (White = road, grey = buildings)

   (a) A customer wants to travel to the corner of 5th street and Avenue F. In how many ways can the taxi deliver its passenger to the final destination?

   (b) In how many ways can the taxi drive four blocks away from the corner of 1st and A?