Math 132: Section 1

Quiz 1

How many ways are there to place 12 marbles of the same size in five distinct jars if a) the marbles are all black? b) each marble is a different color?

a) This is arrangement of

12 x's
4 o's

So the number is

$$\frac{16!}{12!\,4!}$$

b) There are 5 choices for each distinct marble. So

$$12^5$$

3. Determine the number of integer solutions of

$$x_1 + x_2 + x_3 + x_4 = 32,$$

where

(a) $x_1, x_2, x_3, x_4 \geq 0$

$$\frac{35!}{32!\,3!}$$

(b) $x_1, x_2, x_3 > 0, \quad x_4 > 25$

$$\frac{6!}{3!\,3!}$$

(c) $x_1, x_2, x_3 > 0, \quad 0 < x_4 \leq 25$

$$\frac{31!}{28!\,3!} - \frac{6!}{3!\,3!}$$