

Quiz 3

$$1) P_3^7 = \frac{7!}{(7-3)!} = \frac{7!}{4!} = 7 \cdot 6 \cdot 5 = 210$$

2) a, b b, a c, a
a, c b, c c, b

3) (a_1, a_2, a_3, a_4)

2 or 4

$$2 \times 4 \times 3 \times 2 = 48$$

two choices for a_1 ,
 a_2 cannot be a_1 , so 4 choices
 3 choices for a_3
 2 choices for a_4

4) Taking the same approach as in #3, we first choose a_1 , then a_2, a_3 , and a_4 ,

$$2 \times 5 \times 5 \times 5 = 250$$

a_2, a_3, a_4 have no restrictions

5) 1 all must be distinct

Must be 1

to be between 10,000 and 20,000 and even

Must be 3, 5, 7, or 9

$$4 \times 8 \times 7 \times 6 = 1344$$

choices for last digit

choices for middle 3

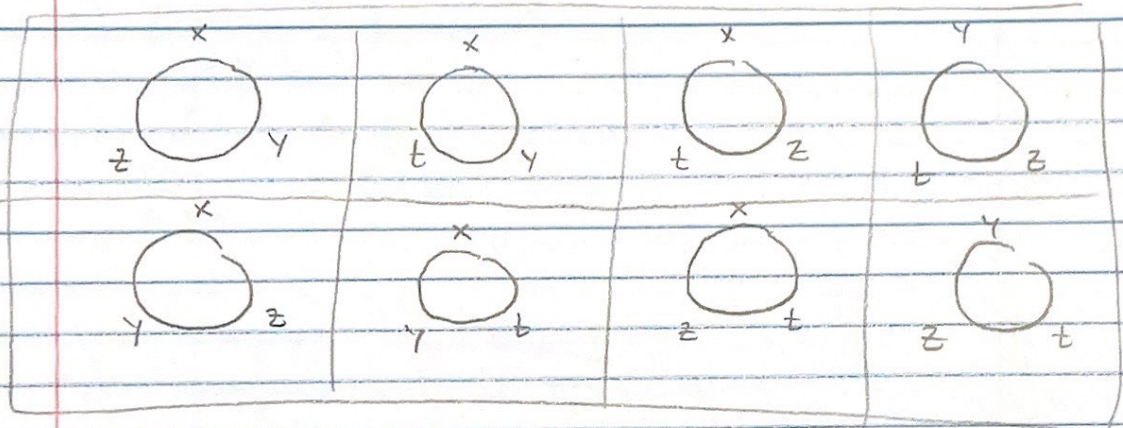
$$6) Q_3^7 = \frac{7 \cdot 6 \cdot 5}{3} = 70$$

or

$$Q_3^7 = \frac{P_3^7}{3} = \frac{\frac{7!}{(7-3)!}}{3} = \frac{7! / 4!}{3} = \frac{7 \cdot 6 \cdot 5}{3} = 70$$

7) There will be

$$Q_3^4 = \frac{4 \cdot 3 \cdot 2}{3} = 8 \text{ possible placements}$$



$$8) P_r^n = \frac{n!}{(n-r)!} \quad Q_r^n = \frac{n!}{r \cdot (n-r)!}$$

$$Q_r^n = \frac{1}{r} P_r^n$$

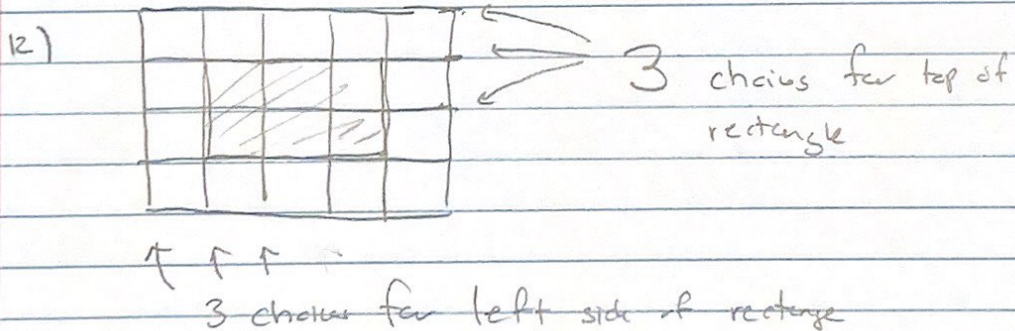
$$9) C_r^n = \frac{n!}{r!(n-r)!}$$

$$10) \binom{5}{3} \binom{5}{2} = 100$$

\uparrow choices for A
 \uparrow choices for B

$$11) \binom{5}{3} \binom{5}{3} = 100$$

\uparrow choices for even
 \uparrow choices for odds



$$3 \cdot 3 = 9$$