

$$\checkmark 1) a) 1 \rightarrow {}_4C_1 \rightarrow 1$$

$$2 \rightarrow {}_4C_2 \rightarrow 4$$

$$3 \rightarrow {}_4C_3 \rightarrow 6$$

11 unique subsets

$$b) 1 \cdot 5! + \frac{4 \cdot 5!}{2} + \frac{6 \cdot 5!}{2} = 480$$

$$\checkmark 2) {}_{13}C_2 \cdot {}_4C_2 \cdot {}_4C_2 \cdot 44$$

$$= \frac{13!}{2! \cdot 11!} \cdot \frac{4!}{2! \cdot 2!} \cdot \frac{4!}{2! \cdot 2!} \cdot 44 = 78 \cdot 6 \cdot 6 \cdot 44$$

$$= 123,552$$

$$3) \text{ songs: } 15$$

$$\text{couple: } 6$$

$$\text{songs: } 16$$

$$\text{couple: } 6$$

$$15 + 6 - 1$$

$$5$$

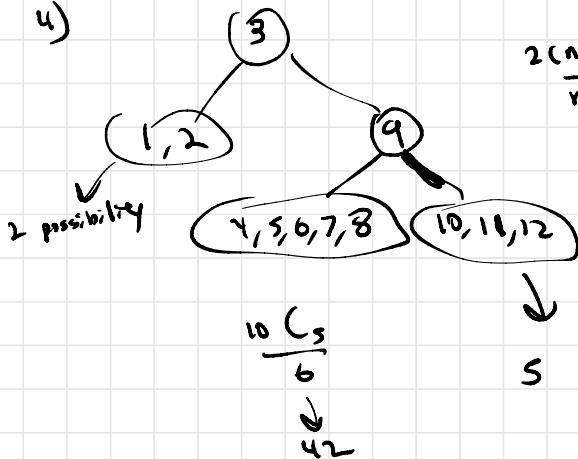
$$16 + 6 - 1$$

$$5$$

$$\frac{1}{1} \cdot \frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{4} \cdot \frac{1}{5} \cdot \frac{1}{6}$$

$${}_{20}C_5 + {}_{21}C_5 = 35853$$

4)



$$\frac{{}_2C_n}{n+1}$$

$$\frac{{}_1C_2}{3} \rightarrow 2$$

$$\frac{{}_6C_3}{4}$$

$$5 \times 2 \times 42$$

$$= 420$$

5) 10 friends, @ least one person

• | • | • | • | • | • | • | • | • | •

1 1 1 7

1 2 1 6

1 2 2 5

1 2 3 4

2 2 2 4

3 3 3 1

4 4 1 1

3 3 2 2

3 5 1 1

$$1 + 8 = 17$$

1 1 8

1 2 7

2 2 6

3 3 4

4 4 2

4 1 5

3 2 5

3 1 6