

# Geo Prob. Review

$$1. \frac{7!}{10!} = \frac{7!}{10 \cdot 9 \cdot 8 \cdot 7!} = \frac{1}{720}$$

$$2. \frac{20!5!}{19!} = \frac{20 \cdot 19! \cdot 5!}{19!} = 20 \cdot 120 = 2400$$

$$3. \frac{10!0!3!}{8!6!} = \frac{10 \cdot 9 \cdot 8! \cdot 1 \cdot 3!}{8! \cdot 6 \cdot 5 \cdot 4 \cdot 3!} = \frac{90}{120} = \frac{3}{4}$$

$$4. \frac{3!5!}{8!} = \frac{3! \cdot 5!}{8 \cdot 7 \cdot 6 \cdot 5!} = \frac{6}{8 \cdot 7 \cdot 6} = \frac{1}{56}$$

$$5. {}_{10}P_7 = \frac{10!}{(10-7)!} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3!}{3!} = 604,800$$

$$6. {}_8C_4 = \frac{8!}{(8-4)!4!} = \frac{8 \cdot 7 \cdot 6 \cdot 5 \cdot 4!}{4! \cdot 4!} = \frac{1680}{24} = 70$$

$$7. a) P(\text{Ice Cream} | 10^{\text{th}}) = \frac{37}{55}$$

$$b) P(\text{Whip} | 11^{\text{th}}) = \frac{37}{122}$$

$$c) P(9^{\text{th}} | C) = \frac{18}{254}$$

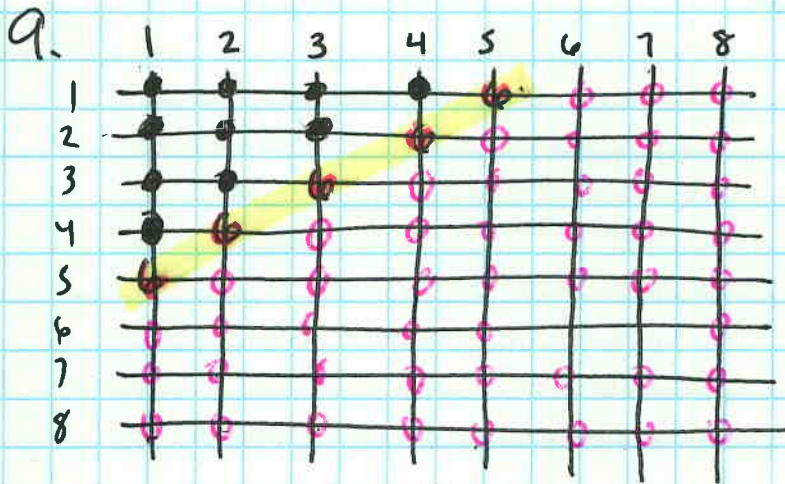
$$d) P(W) = \frac{118}{372}$$

$$8. a. P(>45 \cap L) = \frac{280}{1500}$$

$$b. P(C) = \frac{775}{1500}$$

$$c. P(C|30) = \frac{145}{355}$$

$$d. P(30|C) = \frac{145}{775}$$

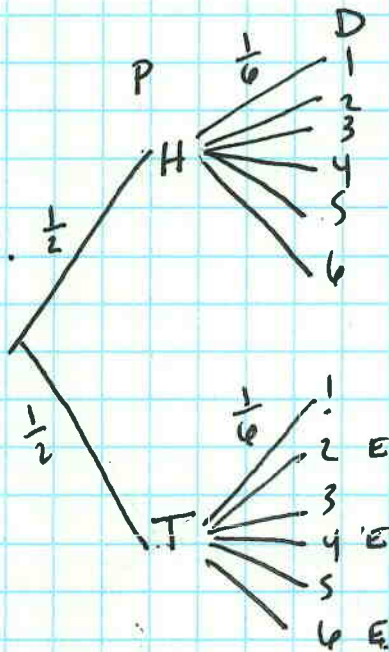


b. sum < 6  
(5 & under)

c.  $P(<6) = \frac{10}{64}$

d.  $P(>6) = \frac{49}{64}$   
7 & greater

10.



a.  $P(H \cap 5) = \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12}$

b.  $P(T \cap E) = \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

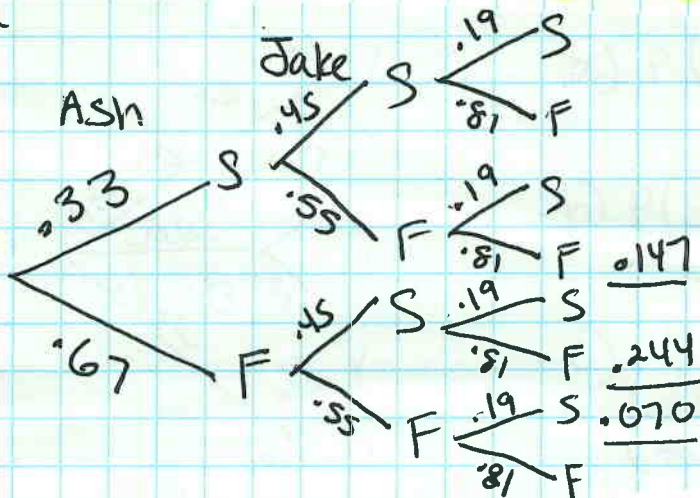
c.  $P(H \cap <6) = \frac{1}{2} \cdot \frac{5}{6} = \frac{5}{12}$

d.  $P(H \cap >6) = \frac{1}{2} \cdot 0 = 0$

11. a.  $P(\heartsuit \diamond) = \frac{1}{4} \cdot \frac{1}{4} = \frac{1}{16}$

b.  $P(Q 8) = \frac{1}{13} \cdot \frac{1}{13} = \frac{1}{169}$

12.



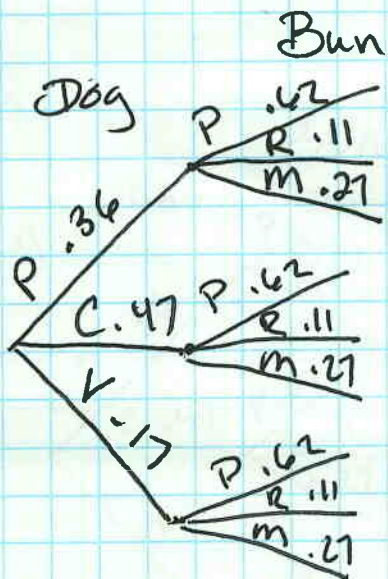
12.  $P(SSS) = .33 \cdot .45 \cdot .19 = .28215$

b.  $P(NNN) = .67 \cdot .55 \cdot .81 = .29845$

c.  $P(SFF) + P(FSF) + P(FFS) = .147 + .244 + .070$

$= .4612$

13



$$\leftarrow a) b) P(CR) = \frac{.47}{.36} \cdot .11 = .0517$$

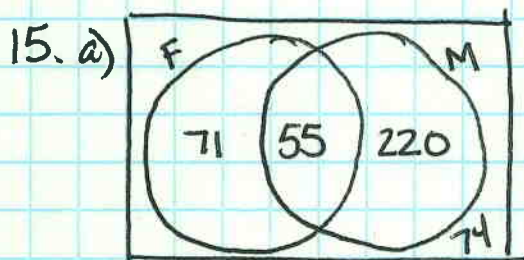
$$c) P(V\bar{P}) = 1 - (.17 \cdot .62) = .8946$$

$$d) P(P\bar{P}) + P(CM) =$$

$$(.36 \cdot .62) + (.47 \cdot .27) = .3561$$

$$14. a) P(S) = .25 \quad b. P(A \cap S') = .12 \quad c. P(S|A) = \frac{.15}{.27} = .555$$

$$d. P(S|A) = .37 \quad 37\% \quad 55.5\%$$



$$b) P(F \cap M) = \frac{55}{420} = .131 \quad 13.1\%$$

$$c. 74$$

16. C, A, S

$$a. {}_7P_3 = \frac{7!}{(7-3)!} = \frac{7 \cdot 6 \cdot 5 \cdot 4!}{4!} = 210 \text{ ways}$$

$$b. {}_7C_3 = \frac{7!}{(7-3)!(3!)} = \frac{210}{3!} = 35 \text{ groups of 3}$$

17. 3 plants

$$a. {}_3P_3 = \frac{3!}{(3-3)!} = 6$$

$$b. {}_6C_3 = \frac{6!}{(6-3)!3!} = \frac{6 \cdot 5 \cdot 4 \cdot 3!}{3!3!} = \frac{120}{6} = 20$$

c. 9 plants  $\rightarrow$  arranged-order matters

$${}_9P_3 = \frac{9!}{9-3!} = \frac{9 \cdot 8 \cdot 7 \cdot \cancel{6!}}{\cancel{6!}} = 504 \text{ ways}$$

18. 3 numbers.

$$\underline{40} \cdot \underline{40} \cdot \underline{40} = 64,000 \text{ combos}$$

19. F O B C order matters

$${}_{10}P_4 = \frac{10!}{(10-4)!} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot \cancel{6!}}{\cancel{6!}} = 5040 \text{ quartets}$$

$$20. {}_{25}C_5 = \frac{25!}{20!5!} = \frac{25 \cdot 24 \cdot 23 \cdot 22 \cdot 21 \cdot \cancel{20!}}{\cancel{20!}5!} = 53,130$$

21. 3 digit lock

$$a) {}_5P_3 = \frac{5!}{(5-3)!} = \frac{120}{2} = 60 \text{ combos}$$

b). 2 even numbers out of 5

$$\frac{2}{5} \cdot 60 = 24 \text{ combos}$$

c) start & end w/ odd

$$\frac{3 \text{ odds} \times 2 \text{ odds} \times 3 \text{ others}}{\text{total}} = \frac{18}{60} = \frac{3}{10}$$

22 7 noms 2 vac. 3M 4W

a. Any 2  ${}^7C_2 = \frac{7!}{5!2!} = \frac{7 \cdot 6 \cdot \cancel{5!}}{\cancel{5!} \cdot 2!} = 21$

b. Any 2 women  ${}^4C_2 = \frac{4!}{2!2!} = \frac{4 \cdot 3 \cdot \cancel{2!}}{\cancel{2!} \cdot 2!} = 6$